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CITY OF SAN FRANCISCO 315
**HOWARD STREET
OFFICE BUILDING**

Publication Date: 30 May 1980
Public Comment Period: 30 May 1980 Through 14 July 1980
Public Hearing Date: 3 July 1980



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DRAFT
ENVIRONMENTAL IMPACT REPORT

315 HOWARD STREET
OFFICE BUILDING

EE 79.196

Written comments should be sent to the Office of Environmental
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SUMMARY

PROJECT DESCRIPTION

The site of the proposed 315 Howard Street office building is the northeast corner of Assessor's Block 3738 (Lot 1) at the intersection of Howard and Beale Streets, San Francisco, California. The site is about 19,000 square feet in area and is part of a larger parcel of land 71,000 square feet in area. The site is now used as a parking lot for 13 cars and van loading for the adjacent 215 Fremont Building. A service station building would be demolished.

The project sponsor, Continental Development Corporation, desires to provide office space in the downtown area. Principal tenants of the adjacent 215 Fremont Building (the U.S. Environmental Protection Agency, Pacific Telephone and Telegraph Company and the California Culinary Academy) have expressed a need for expansion, although the extent of expansion into the proposed building has not been determined. Other major tenants are not known.

The proposed structure would contain 24 floors (excluding the mechanical penthouse level) with a gross floor area of about 389,600 square feet. The building would rise 320 feet in height and measure approximately 128 feet horizontally on each side. The ground level would be an open covered landscaped area and not developed for office use, permitting vehicular service operations to continue unchanged for the 215 Fremont Building. The new building's receiving and loading area would be separated from the entrance lobby and open area.

The north corner of the proposed building would be set back about 30 feet from the curb of the intersection of Howard

and Beale Streets, forming a building face at a 45 degree angle to Howard and Beale Streets. The upper floors would be progressively set back to form terraces and the building's exterior would be clad in semireflective glass.

Construction cost of the project is estimated at about \$21,000,000 (1979 dollars). Project sponsor estimates that construction would begin in October 1980 and that occupancy would begin 18 months later in April 1982.

IMPACTS AND MITIGATION MEASURES

A. Visual Quality and Urban Design

Impact: Cumulatively, the structure would contribute to the total mass of buildings blocking views to the Bay from hillside locations in the City. The degree of view blockage would vary with respect to the location of the observer.

Mitigation: From a visual standpoint, the alternative of a lower building would assist in retaining existing views of the Bay.

B. Transportation

Impact: The project would generate an estimated 2,030 daily vehicle trips, of which about 900 (44%) would be employee commute trips, and the remaining 1,130 (56%) would be noncommute trips (i.e., project visitor trips, employee trips other than to/from work, etc.). An estimated 340 vehicle trips would be generated by the project during the evening peak hour. This can be compared to the 7,150 vehicles currently leaving downtown San Francisco via the 5 freeway on-ramps in the downtown area south of Market Street during the evening peak hour. However, traffic using these ramps does not comprise all traffic leaving the downtown area.

Impact: The cumulative number of vehicle trips estimated to be generated by downtown San Francisco office developments either under construction or proposed north and south of Market Street by 1982 would be about 59,800 daily trips and 10,000 trips during the evening peak hour. Existing delays would be increased, and the peak period would be extended in length throughout much of the downtown area. It is estimated that the vehicular traffic generated by 315 Howard Street would contribute about 3-4% of the cumulative traffic impacts of these projects.

Impact: No parking spaces would be provided by the project. The project would generate an estimated parking demand of 405-414 long-term and 140 short-term spaces.

Mitigation: Emphasis would be placed on ride-sharing and flextime measures, and use of other transit modes, including bicycling, walking, jitneys, van-pools, and charters to reduce traffic and parking impacts. Project sponsor has committed to provide 6 free parking spaces for van pools and free bicycle parking areas at 215 Fremont.

Impact: A total of about 10.2 million square feet of office space in 21 buildings including the proposed project would be added to the downtown area by 1982 if the presently proposed buildings are constructed. Cumulative impacts on transportation would be in direct proportion to square footage of floor space. The 315 Howard project would represent about 2% of projected 1982 transit system ridership increases. For MUNI and BART the cumulative travel impacts would depend largely on their ability to expand their capacities as planned, i.e., within the set time frame and within the assumed operating budget. Additional funding would be required to subsidize the service expansions on AC Transit (\$720,000 per year), Golden Gate Transit (\$725,000 per year) and Southern Pacific (\$363,000 per year).

Mitigation: The project sponsor would contribute to funds for maintaining and augmenting transportation service in an amount proportionate to the demand created by the project through a funding mechanism to be developed by the City. Continental Development Corporation will help fund the Chamber of Commerce-sponsored transit improvement program for the downtown.

C. Noise

Impact: Traffic noise would generate peaks of up to 56 dBA inside the building; this could interrupt a speaker talking in a normal tone of voice in a small conference room. Noise levels on the 24th floor would be several dBA less.

Mitigation: An analysis of the noise reduction requirements of the proposed building would be made, and needed noise insulation features would be included in the design.

Impact: Because the building at 215 Fremont shares the property line with the proposed project, noise-generating construction activities would occur within 5 or 10 feet of the outside of that building. At this distance, noise levels inside the nearest offices would reach 95 to 100 dBA during pile-driving. Office workers would not be able to carry on a conversation, or use the telephone, would be distracted from their work, and would probably complain to management about the noise.

Mitigation: Pile-driving would take place when the least number of people would be impacted. For the project site, that would be after office hours at the 215 Fremont Building and on weekends. Pile holes would be predrilled to minimize the depth through which the piles would be driven.

D. Climate

Impact: Westerly wind speed would increase at the Howard/Beale intersection and shadows from the proposed building would affect sidewalk areas adjacent to the project site in all seasons. Open areas of the ground floor would experience uncomfortable winds with periods of turbulent wind which would carry dust and litter.

Mitigation: To help mitigate wind conditions, project sponsor has indicated that street trees would be planted around the perimeter of the building as well as in portable planters around the ground floor plaza.

E. Geology and Seismicity

Impact: If an earthquake of a maximum estimated magnitude of 8.25 on the Richter scale were to occur along the San Andreas Fault, the project site would experience groundshaking, which could have such effects as cracking building walls and permanent deformations of structural members.

Mitigation: A geological report has been prepared for the design and structural work to be performed. The recommendations contained within this report would be adhered to. The project sponsor would require the structural engineer to provide the design of the structural elements of the project to be greater than the requirements set forth in the current San Francisco Building Code.

F. Energy

Impact: Preliminary calculations based on operating data for similar office buildings indicate that the annual energy consumption of the proposed project would be 48.6 billion BTU; this is equivalent to approximately 9,000 barrels of oil.

Mitigation: Title 24 regulations of the California Administrative Code set a maximum allowable energy consumption for nonresidential buildings with an occupancy of over 300 persons. Energy conservation design measures are being considered to reduce consumption of natural gas and electricity to exceed the requirements of Title 24. The semi-reflective glass and automatic exterior zone light switching proposed for the building would help conserve energy.

G. Economics

Impact: An estimated \$21 million would be spent on construction and interior finishing. Assuming about 40% in labor costs for the shell, and 50% for the interior, including direct wages, payroll taxes and fringe benefits, about \$8.8 million would be spent on labor. Assuming an annual cost, including wages, taxes and benefits of \$26,000 per construction worker, a total of 338 person-years of construction labor would be generated by the project. It would be expected that projected revenues to the City and County of San Francisco of from \$439,000 to \$520,000 annually resulting from the project would exceed costs directly attributable to the project.

H. Growth Inducements

Impact: To the extent that the project would attract new residents or commuters who would not otherwise have been attracted to San Francisco or the Bay Area, it may be viewed as employment-generating and growth-inducing, and would result in a variety of indirect growth effects including additional demand for housing and for commercial, social, medical and transit services.

ALTERNATIVES

Alternatives to the proposed project considered in this document include the no-project alternative, development under the previously proposed initiative limiting height and floor area ratios of buildings in downtown San Francisco, alternative designs and a 21-floor alternative.

I.
PROJECT DESCRIPTION¹

A. LOCATION

The site of the proposed 315 Howard Street office building is on the northeast corner of Assessor's Block 3738 (Lot 1) at the intersection of Howard and Beale Streets, San Francisco, California. The project site consists of about 19,000 square feet of land and is part of a larger parcel of land 71,000 square feet in area. The general location of the project site in San Francisco is shown in Figure 1, Regional Location Map. The precise location and approximate boundaries of the project site are shown in Figure 2, Site Location Map.

¹Because current and proposed building construction exists in the general area of the 315 Howard project site, reference is made throughout this report to those current and proposed projects, including the relevant EIRs. This is done to (1) provide supplemental information that relates to the proposed 315 Howard project, and (2) to address cumulative impacts.

The following project EIRs are available for public inspection at the Office of Environmental Review, 45 Hyde Street, San Francisco, California 94102:

Final Environmental Impact Report, 595 Market Street, EE 74.322,
certified 18 December 1975.

Final Environmental Impact Report, Yerba Buena Center,
EE 77.220, certified 25 April 1978.

Final Environmental Impact Report, 333 Market Street Building.
EE 77.98, certified 6 October 1977.

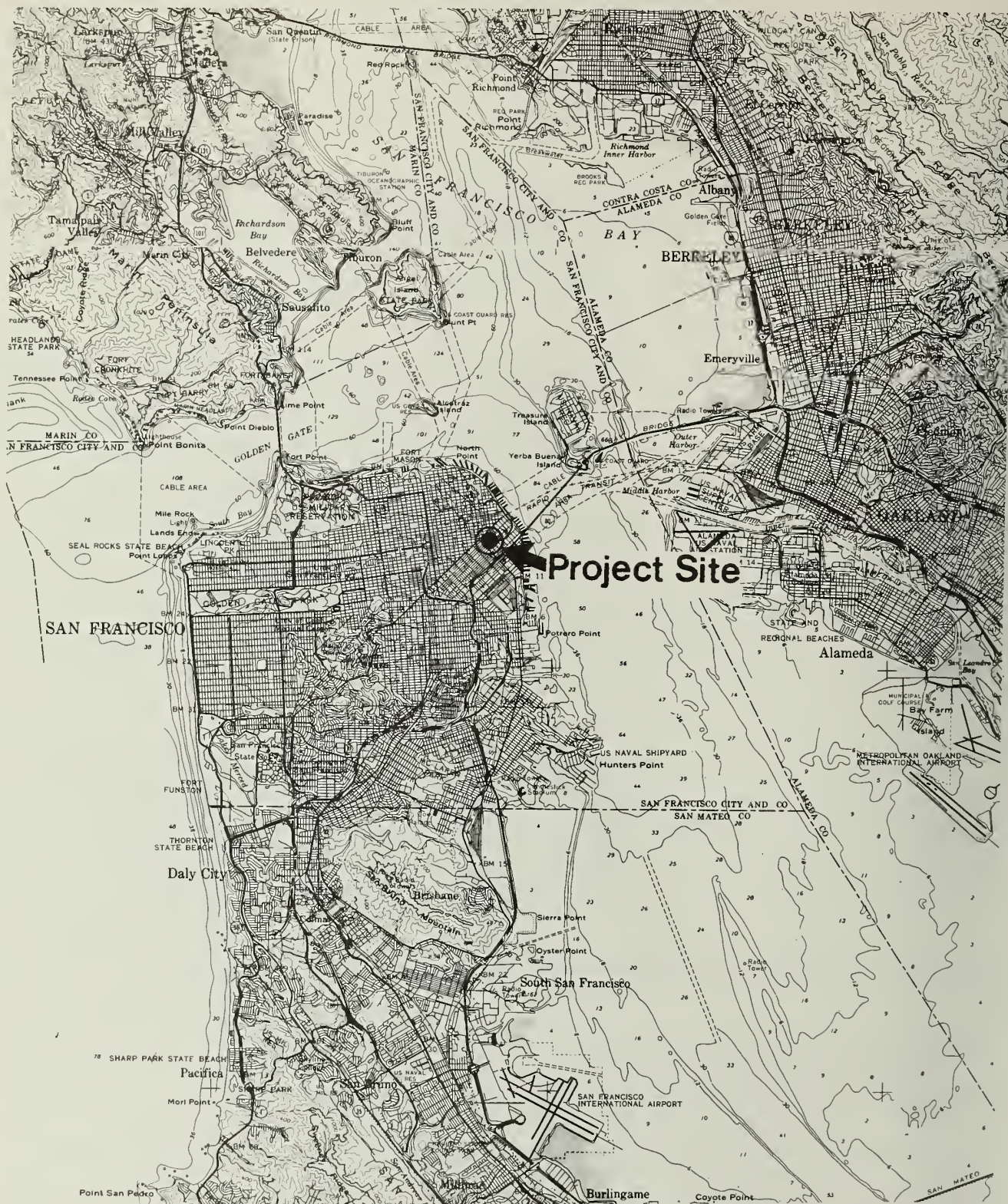
Final Environmental Impact Report, Levi's Plaza, EE 77.256,
certified 14 December 1978.

Final Environmental Impact Report, 101 California Street,
EE 78.27, certified 9 August 1979.

Final Environmental Impact Report, Pacific Gateway Office
Building Project, EE 78.61, certified 26 July 1979.

Final Environmental Impact Report, Federal Reserve Bank of
San Francisco, EE 78.207, certified 14 June 1979.

Final Environmental Impact Report, Crocker National Bank,
EE 78.298, certified 26 July 1979.



Regional Location Map

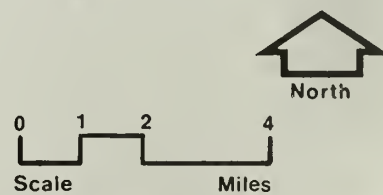
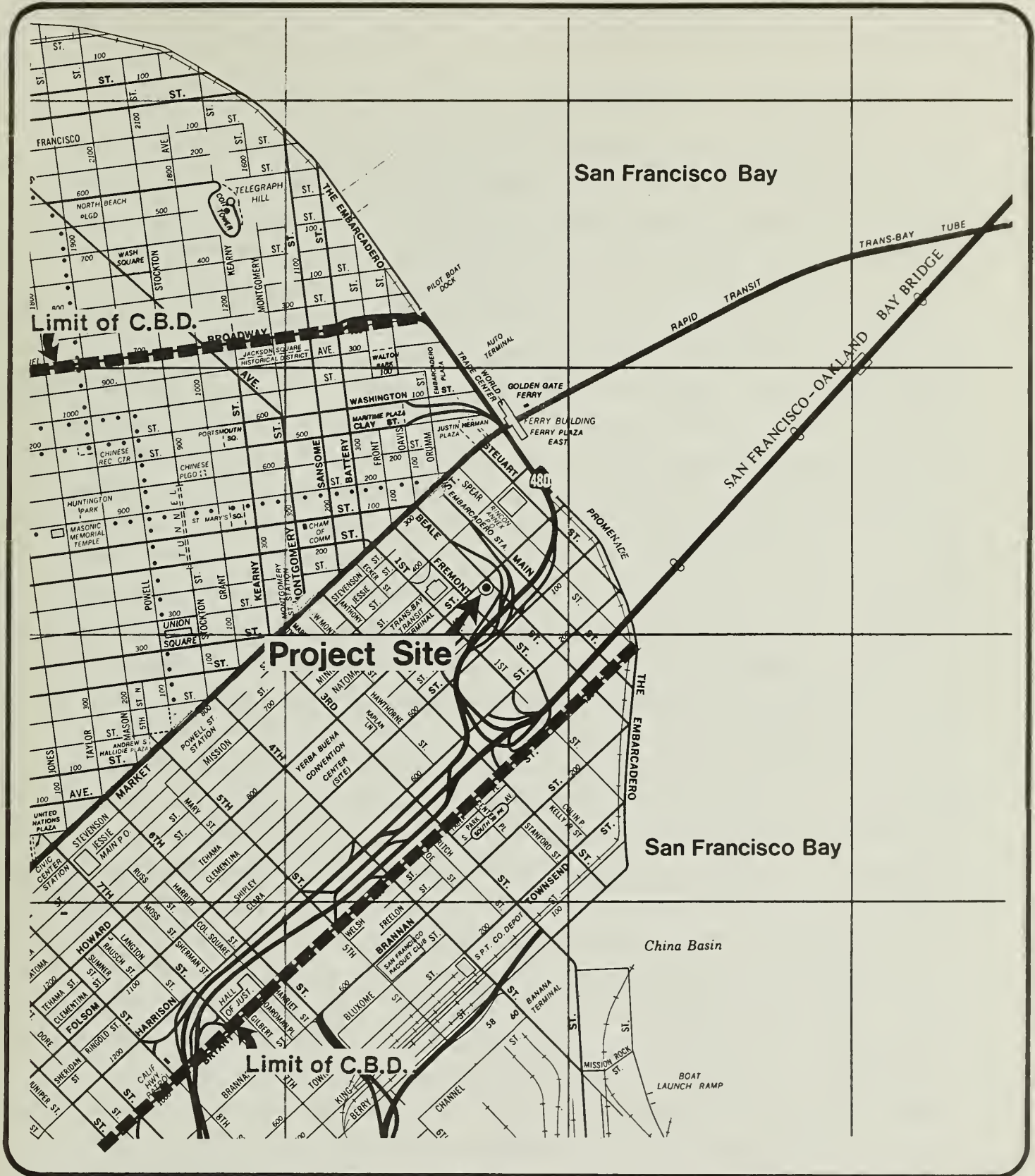


Figure No.1



Site Location Map (with Central Business District shown)

Note: C.B.D. extends west to Van Ness Ave.

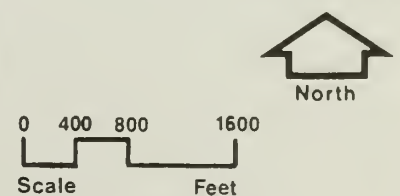


Figure No. 2

B. OBJECTIVES OF SPONSOR

The project sponsor, Continental Development Corporation (CDC), located in San Francisco since 1972, desires to provide an office building to lease space to prospective tenants in order to receive a reasonable return of investment capital (see Section III.I, Economics, page 111).¹ Based on marketing surveys prepared for CDC, which indicate a continued need for office space in San Francisco, and based on the marketing success of the adjacent, existing 215 Fremont Building (an office building, formerly the Del Monte Building, built in 1928 and renovated by CDC in 1976 and 1977), the project was determined to be economically feasible. Prior to the time CDC purchased the 215 Fremont Building from Del Monte Corporation in 1973, a study was made of the feasibility of constructing a new building on the undeveloped corner at 315 Howard Street. This consideration prompted the decision to proceed with major restoration and renovation work on a 50-year old existing building, rather than demolition, and was a major factor in the original acquisition of the property. While the project sponsor does not limit development solely to renovation of older buildings, the sponsor concentrates on renovative developments, exemplified by the 215 Fremont Street Building and the proposed renovation of the Ferry Building Complex (including Pier 1 and the Agriculture Building) for which CDC recently has executed a Design and Development Agreement with the San Francisco Port Commission. CDC considers the 315 Howard Street Building as an addition to the existing 215 Fremont Street Building rather than as a separate development since the proposed project shares the same lot with the existing 215 Fremont Street Building and since the project has been designed to accommodate expansion by the existing tenants, the U.S. Environmental Protection Agency, the Pacific Telephone and Telegraph Company and the California Culinary Academy. The existing tenants have indicated a need for expansion, although the extent of expansion has not been determined. Other major tenants are not known at this time; however, two floors are designed to accommodate computer installations and the occupancy by a computer-oriented firm(s) is contemplated.

¹See also Section II.I., Economics, page 52.

C. PROJECT CHARACTERISTICS AND SCHEDULING

The proposed structure would contain 24 floors (excluding the mechanical penthouse level) and a gross floor area of about 389,600 square feet. The building would rise 320 feet in height and measure 128 feet on each side (see Figures 3 and 4, pages 14 and 15).

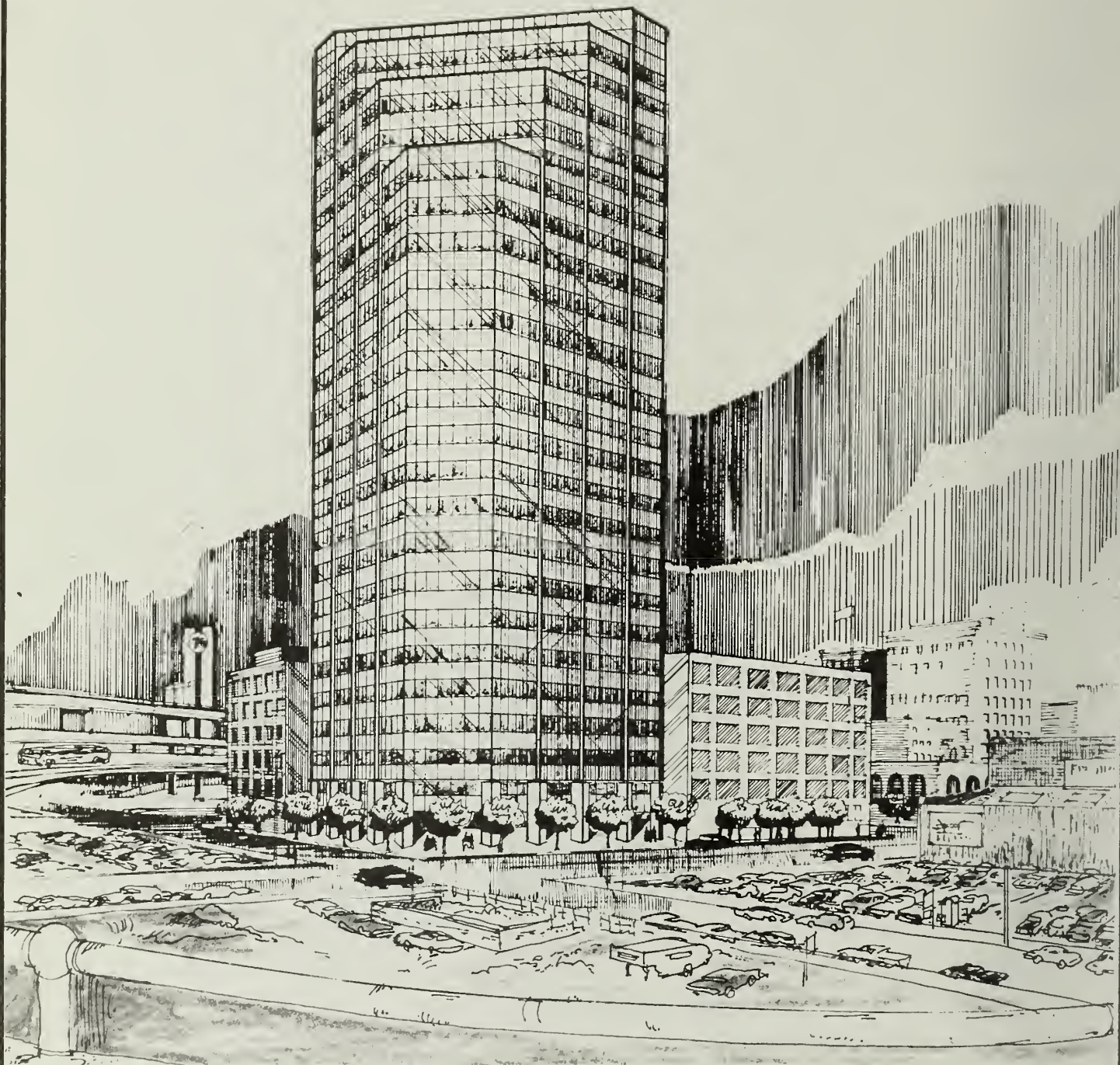
The proposed building would fit into a corner of the L-shaped 215 Fremont building (see Figures 5 and 6, pages 16 and 17). The lower 6 floors of the new structure would align horizontally with the floors of the 215 Fremont building should expansion from the existing structure into the proposed building be desired in the future (see Figure 7, page 18). The proposed building would be set back 10 feet from exterior walls of the 215 Fremont building and potential future connections between the 2 structures would be provided by enclosed pedestrian walkways, in the event that common floors are occupied by a tenant in 215 Fremont and 315 Howard. Central elevator service would be provided at the ground level. The ground level would contain an open, covered landscaped area with a lobby entrance to the new building and service entry to the existing 215 Fremont building (see Figure 5, page 16). Small commercial areas would be provided at the ground floor next to the entrance lobby, such as a flower shop, cigar store, or newsstand.

The receiving and loading area would be separated from the entrance lobby and open area and vehicular ramp access would be provided from the south via Fremont and Beale Streets to the existing basement parking area of the 215 Fremont building.

The north corner of the proposed building would be set back from the intersection of Howard and Beale Streets (see Figures 3 and 5, pages 14 and 16). The upper floors would be set back to form diagonal terraces, with the 23rd floor terrace to be used as an observation deck, and the building's exterior would be clad in semi-reflective glass. The building would be designed to allow for the incorporation of a restaurant on the 7th or 24th floor.¹ Construction cost of the project is estimated at about \$21,000,000 (1979 dollars).²

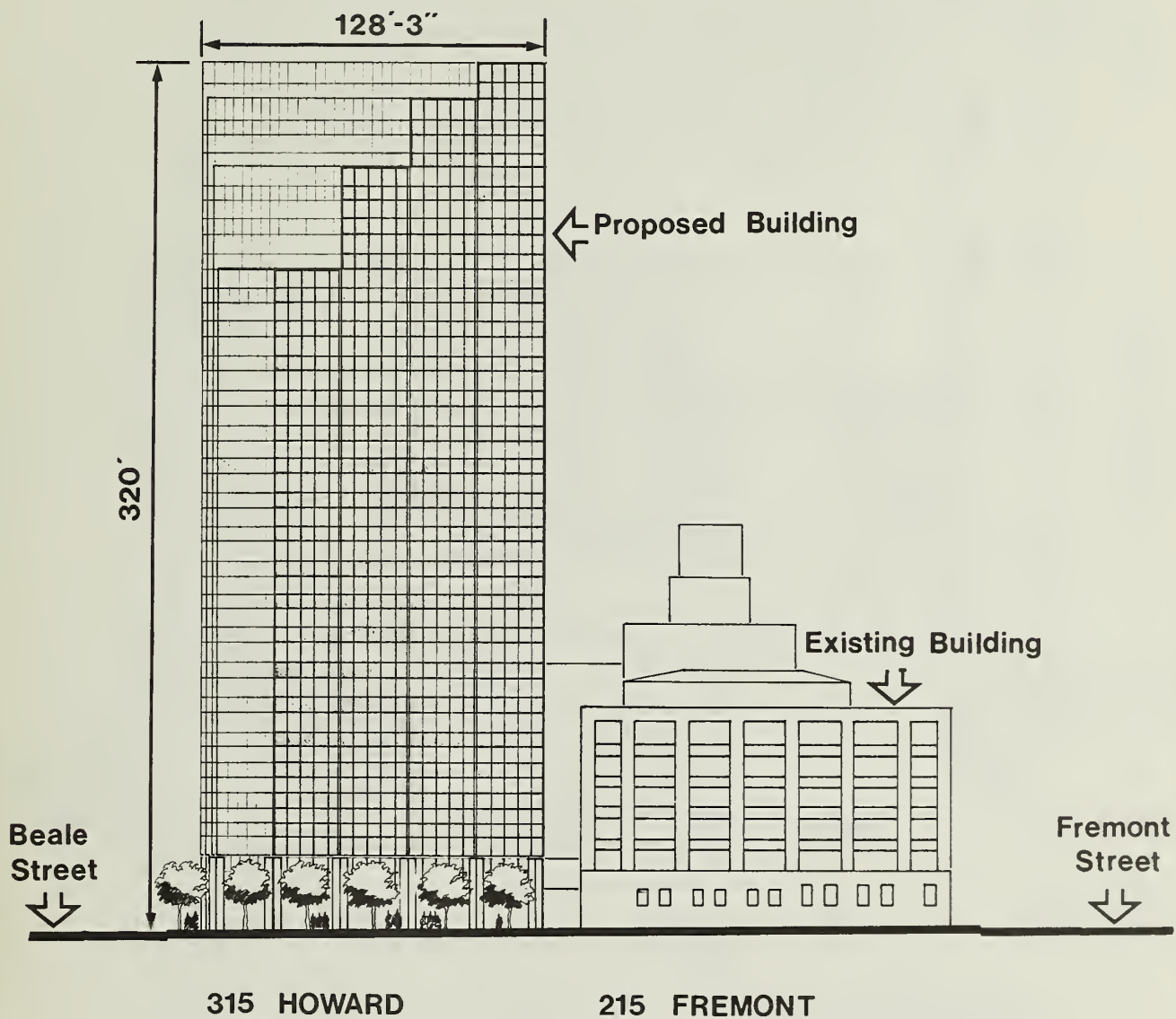
¹Allerton Blake, Project Manager, Continental Development Corporation, project discussion, 19 June 1979.

²Ibid.



Perspective Drawing of Proposed Building
(View south from Transbay Terminal Bus Ramp,
approximately 30 feet above ground)

Figure No.3



Building Elevation

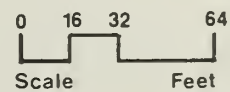
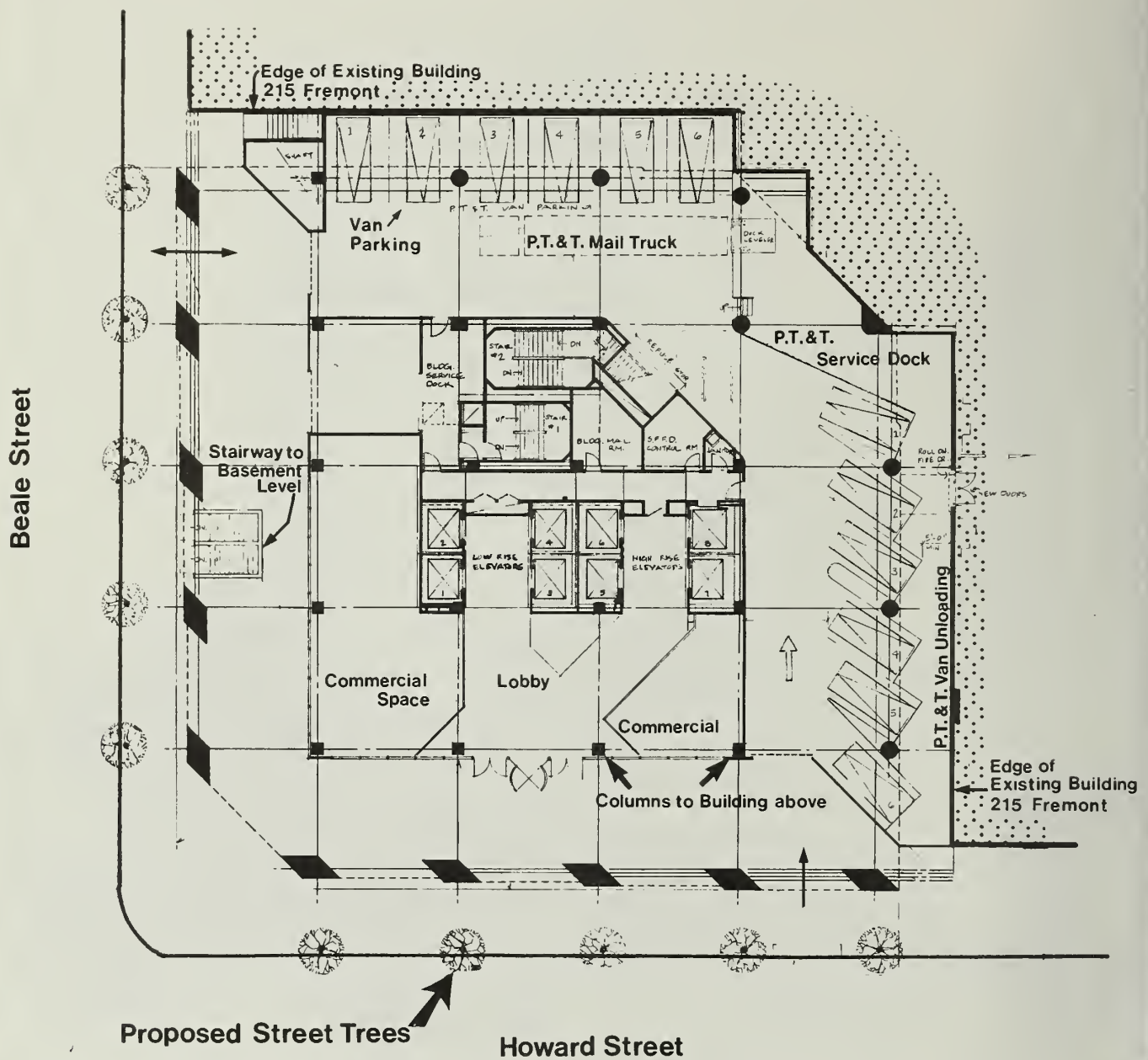
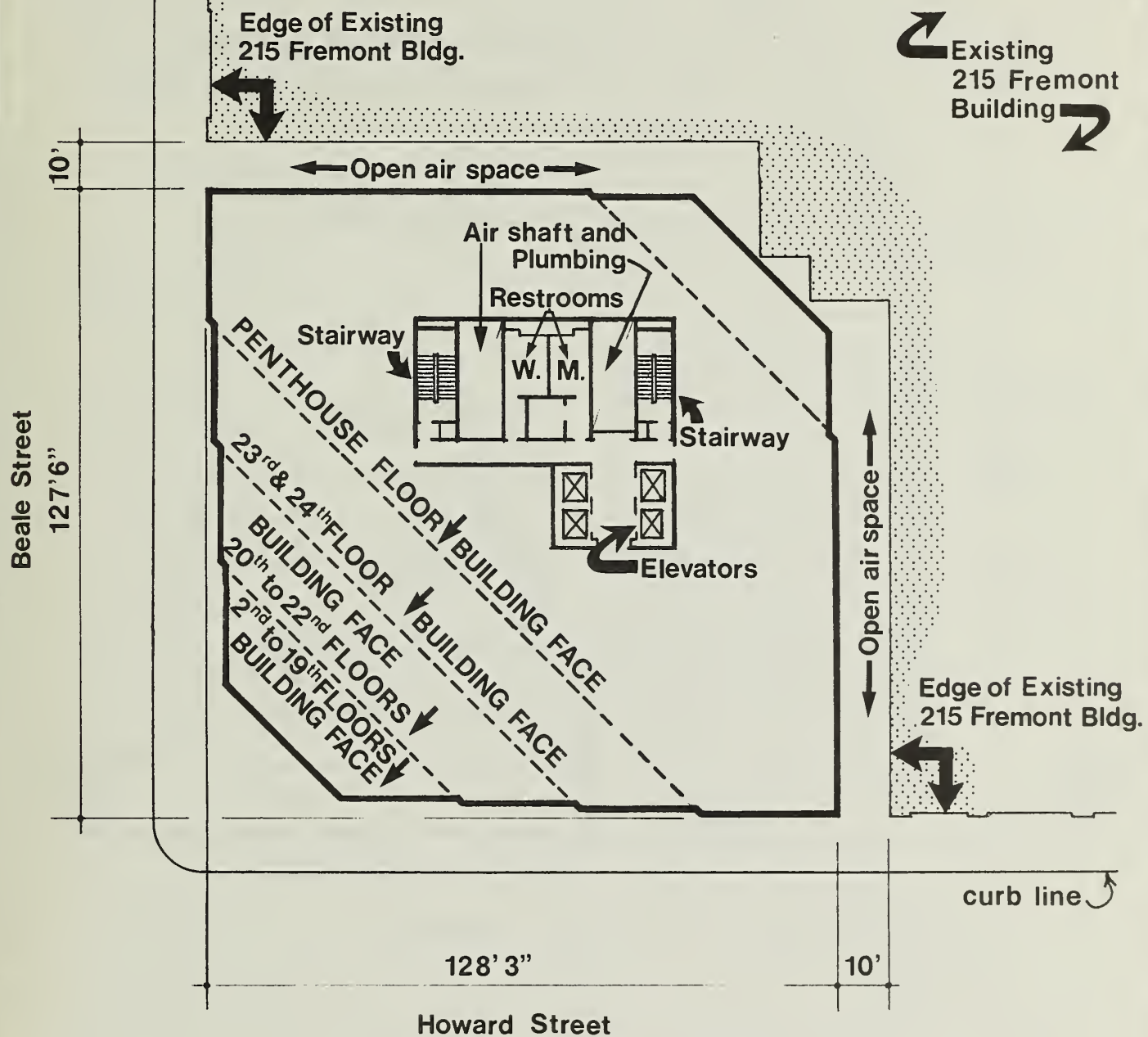


Figure No.4



Ground Floor Plan

Figure No. 5



Typical Floor Plan

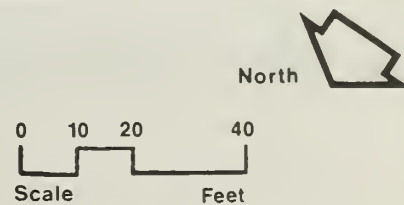
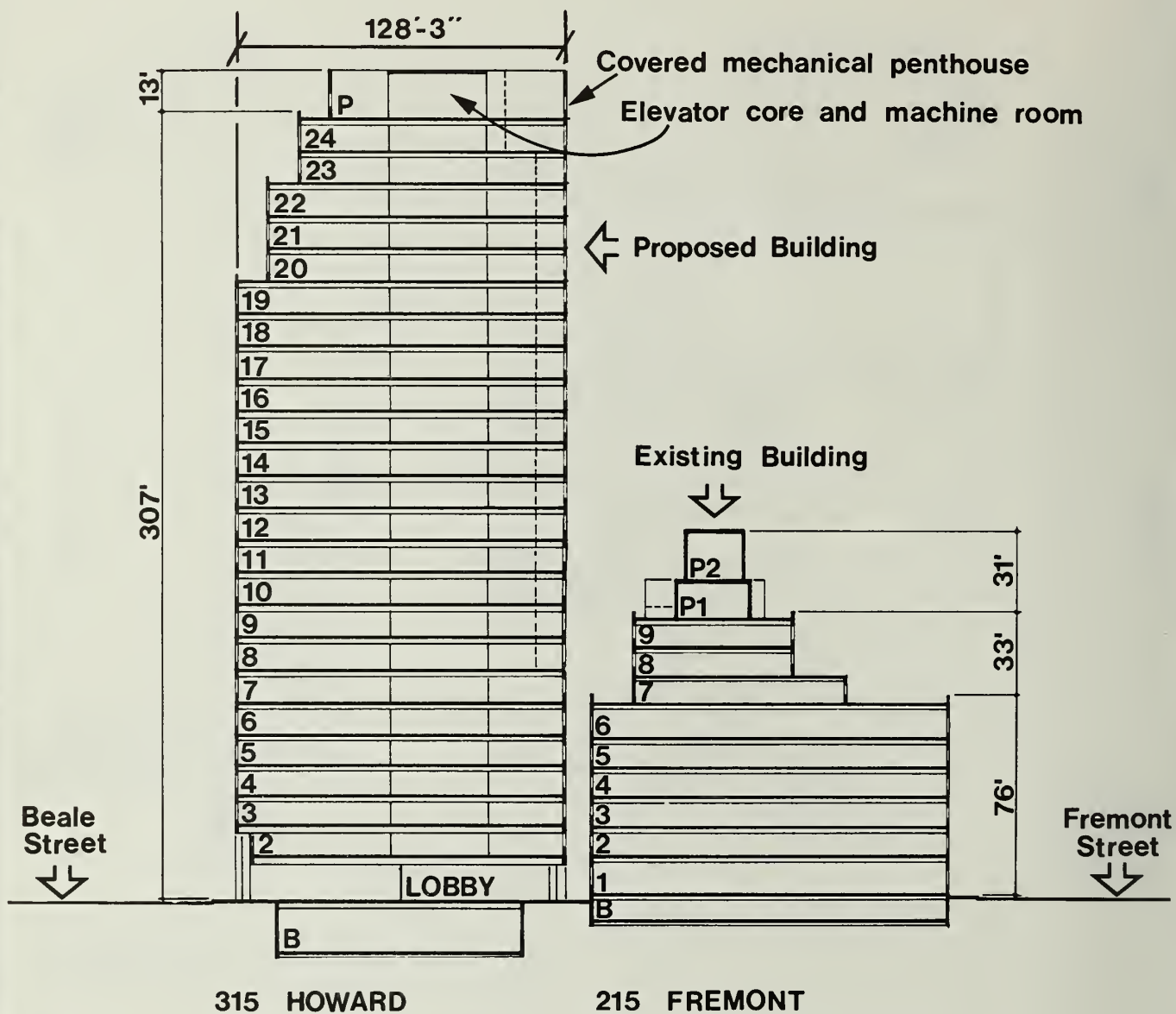


Figure No. 6



Section through Building

0 16 32 64
Scale Feet

Figure No.7

The project sponsor estimates that construction would begin in October 1980 and that the shell would be completed 18 months later, in April 1982. Architects for the project are Gensler and Associates located in San Francisco.

D. ZONING AND REQUIRED APPROVALS

The site is in the eastern part of the C-3-S (Commercial Support) zoning district (see Figure 8, page 20). Professional offices are a principal use in this district.¹

The basic floor area ratio (FAR) allowable in the C-3-S district is 7:1; thus, any building on the site may contain a total gross floor area of up to 7 times the area of the lot.² This is exclusive of development bonuses, which may be awarded for the addition of such amenities as rapid transit access, multiple building entrances, plazas and side setbacks.³ Claimed as bonuses for this project are parking access, multiple building entrances, sidewalk widening, shortened walking distance (diagonally between Howard and Beale Streets) and observation deck. If the bonuses are awarded as claimed, the effective FAR becomes 8.77:1.

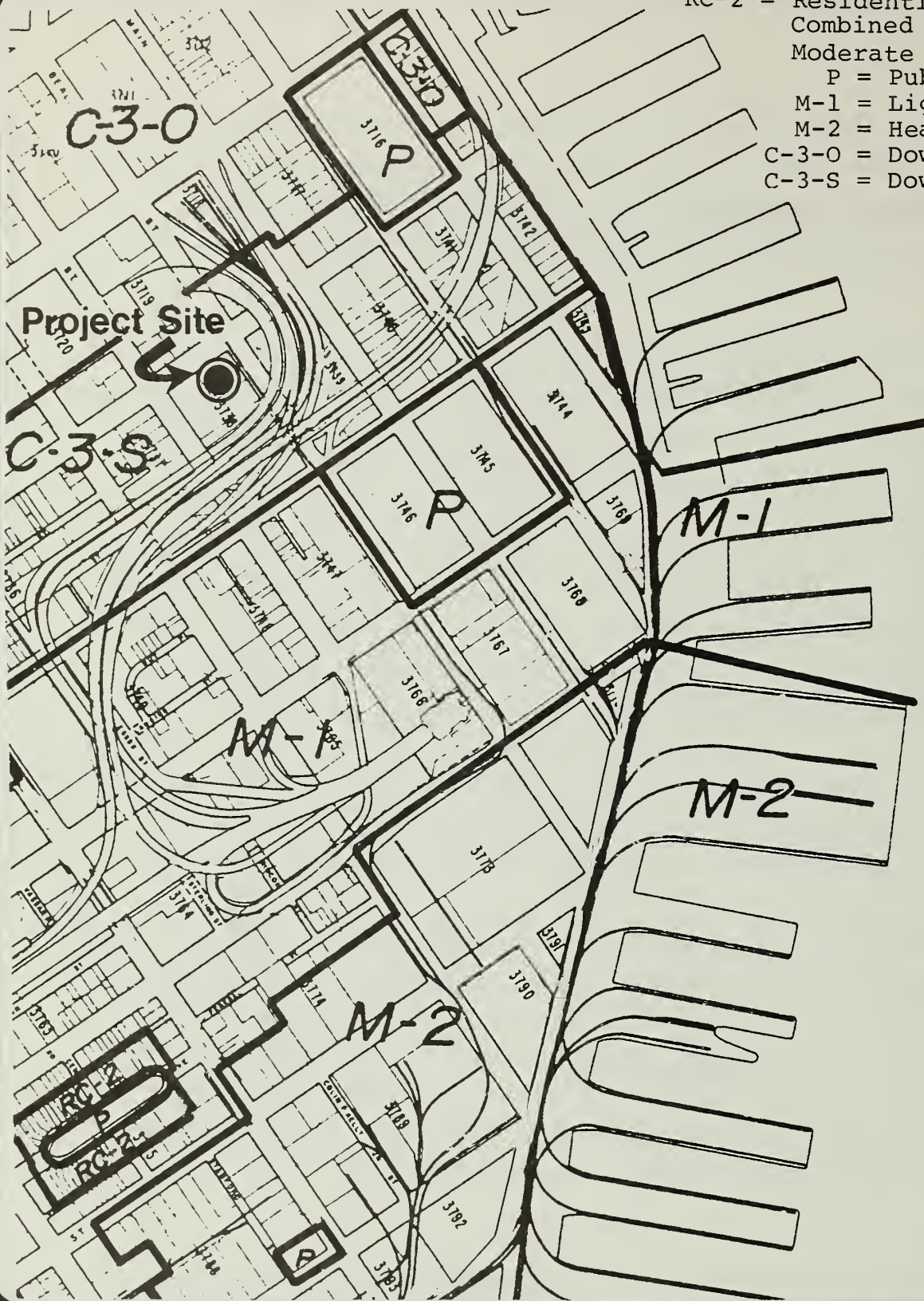
The proposed project would require Discretionary Review by the City Planning Commission, i.e., a review of the building permit application which would include, but not be limited to, an analysis of "protection and enhancement of the pedestrian environment, preservation of architecturally and historically significant buildings, preservation of housing, avoidance of industrial displacement, adequate and appropriate means of trans-

¹Sections 210.3 and 219 of City and County of San Francisco Planning Code.

²For the purposes of FAR calculations, the project site is Lots 1, 2, and 9, Assessor's Block 3738, and has an area of 71,897 square feet. It includes the existing 316,393-square-foot building at 215 Fremont Street.

³Section 126 of City and County of San Francisco Planning Code.

RC-2 = Residential-Commercial
Combined Districts,
Moderate Density
P = Public Use
M-1 = Light Industrial
M-2 = Heavy Industrial
C-3-O = Downtown Office
C-3-S = Downtown Support



San
Francisco
Bay

Zoning Map

Source: Zoning Map of the City and County
of San Francisco, 1978

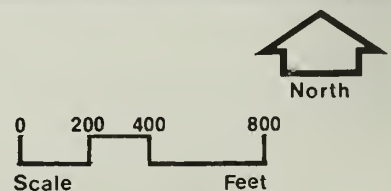


Figure No. 8

portation to and from the project site, energy conservation, physical relationship of the proposed building to its environs, (and) effect on views from public areas and on the City Skyline."¹ (Note that the Planning Commission has instructed City Planning staff to prepare a proposed amendment to the Planning Code to remove floor area bonuses.² Since a building permit for the proposed project was filed prior to 3 January 1980, the proposed amendments would not apply to this project.)

The height and bulk district for the site is 320-I, which allows a maximum building height of 320 feet, with a maximum building length of 170 feet and a maximum diagonal building dimension on the roofline of 200 feet (above a height of 150 feet). The proposed building would be 320 feet in height, and have a length of approximately 127 feet on a side with a diagonal dimension of 180 feet. It therefore would conform to the height and bulk requirements.

¹San Francisco City Planning Commission, Resolution 8474, 17 January 1980.

²San Francisco City Planning Commission, Resolution 8480.

II.

ENVIRONMENTAL SETTING

A. VISUAL QUALITY AND URBAN DESIGN

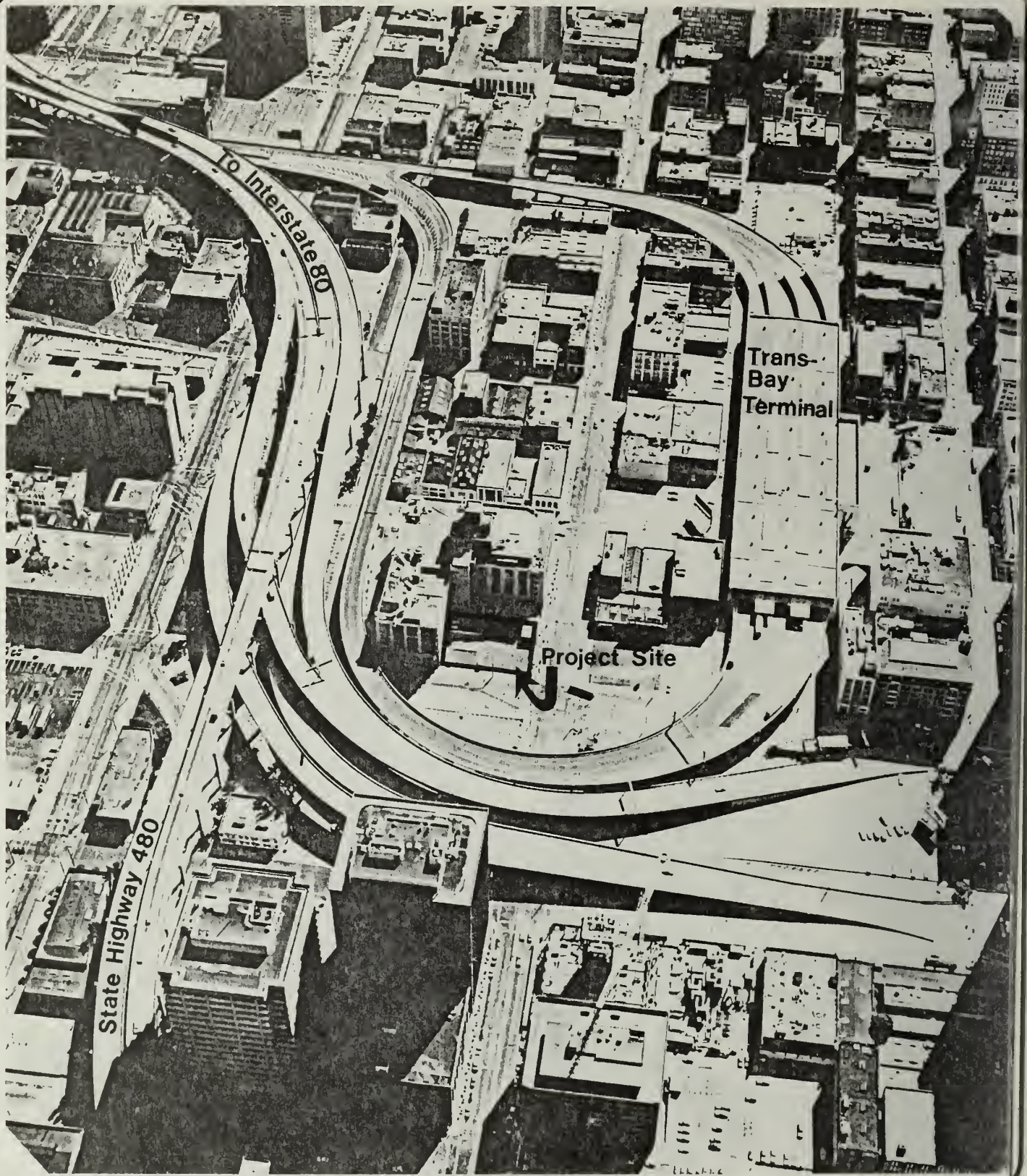
The proposed project site is in an area south of Market Street that has not had as much new construction during the last 10 years as has occurred north of Market Street, particularly in the Financial District (see Figure 9, page 23). Buildings within a 2-block radius of the project site are characteristically 2 to 5 stories in height with a few ranging up to about 20 stories in height (see Figure 10, page 24). The TransBay Transit Terminal is about 1½ blocks north of the project site, and although relatively low in profile, about 3 stories, it covers more ground than any other structure in the area and, correspondingly, is visually a bulky building.

Because there is no visually prominent structure on the project site (see Figure 11, page 25), the site does not now stand out within the field of view. The project site and the 6-square-block area to its west are encircled by elevated access and egress ramps for the use of buses that enter and leave the TransBay Terminal. In addition, the elevated portions of Interstate 80 leading to and from the San Francisco-Oakland Bay Bridge and on/off ramps of State Highway 480 encircle the lands adjacent to the southern and eastern areas of the project site. These structural elements and the project site are visible from portions of taller buildings near the project site that



**Project Area Photograph
(view direction is east)**

Figure No.9



**Project Area Photograph
(view direction is southwest)**

Figure No.10



View of 215 Fremont building and project site. Photo taken from bus ramp at intersection of Howard and Beale Streets. View is toward the south.

Project Site Photograph

Figure No.11

face it (General Services Administration building at the corner of Main and Howard, Pacific Telephone building at the corner of New Montgomery and Natoma) as well as from tall buildings aligned along Market Street and Mission Street from Spear Street to about Third Street (PG&E building, Bechtel building, Metropolitan Plaza building, 525 Market building). Farther north, views toward the project site are increasingly obstructed due to the predominantly tall structures fronting Market Street. The site can be seen from the vehicular overpasses in the project area.

At ground level near the project site, views north toward the Financial District take in tall buildings ranging up to about 50 stories in height. The visual impression to be gained is one of an urban environment where the skyline is defined by the profile of horizontal rooflines. Areas to the south and east of the project site are obstructed from view at ground level by the elevated highway ramps and vertical columns that support them. There is visual contrast between the low-profile, older buildings of the project area (symbolizing industrial land uses of the past) and the appearance of skyline areas to the north created by tall and newer buildings devoted to office use.

B. LAND USE

The proposed project site is beyond the core of the downtown financial district, in an area that is undergoing transition from wholesaling, warehousing and manufacturing activities to office development. Consequent shifts from blue-collar to white-collar employment are occurring.

Land uses within the immediate vicinity of the project site are predominantly office space and parking, with some industrial uses (see Figure 12, page 27). To the east of the site, across Beale Street, are the overpass ramps of the Bay Bridge

and Embarcadero freeway. Parking is located underneath these overpass structures. Farther to the east are the recently constructed 17-story Veterans Administration Office Building at 211 Main, the 221 Main office building and the 5-story remodeled Folger Building containing offices. Also to the east of the site is the construction site for the 13-story Howard and Main office building (EE 74.140) and 2-story buildings containing a restaurant, print shop, antique store and offices. The proposed 33-story Pacific Gateway office building site (EE 78.61) is on Mission Street between Main and Beale Streets. A proposed 18-story building at 150 Spear Street (EE 78.413) and a proposed 18-story building at 101 Mission Street (EE 79.236) are also to the southeast (see Figure 12).

To the north of the site are parking areas, various public relations, travel and telecommunications offices, a restaurant, bar, cafe and clothes shop. The TransBay Terminal building extends north and west of this area.

To the south of the project site is the freeway overpass. Beyond Folsom Street, land uses are principally industrial and include printers, lithographers and engravers, the PG&E Embarcadero substation and a United States Postal Service site (part of the Rincon Annex). The Sailors' Union of the Pacific building is at Harrison and First, and the Marine Electric building is at 340 Fremont. A 2-story building, formerly occupied by a blacksmith and tool manufacturer, has been remodeled as professional office space at 353 Folsom.

The project site is occupied by an unused gasoline service station (2 pumps) and parking area. Nine parking spaces are leased by PT&T; 7 are used for van loading to the 215 Fremont Building and 2 are used for auto parking. Thirteen additional parking spaces are rented to the public by Continental Development Corporation on a monthly basis.

C. TRANSPORTATION

1. General Accessibility

The project site is in an area of transportation accessibility (see Figure 15, page 38). Within about 1,500 feet of the site (3 city blocks) there are 7 freeway ramps, the Embarcadero BART station, and approximately 26 MUNI lines. The Transbay Transit Terminal is about one-half block from the project site. Regional transit service from the Transbay Terminal is provided by AC Transit, SamTrans and Golden Gate Transit. The Golden Gate Ferry Terminal is about 2,200 feet (4 city blocks) north of the project site.

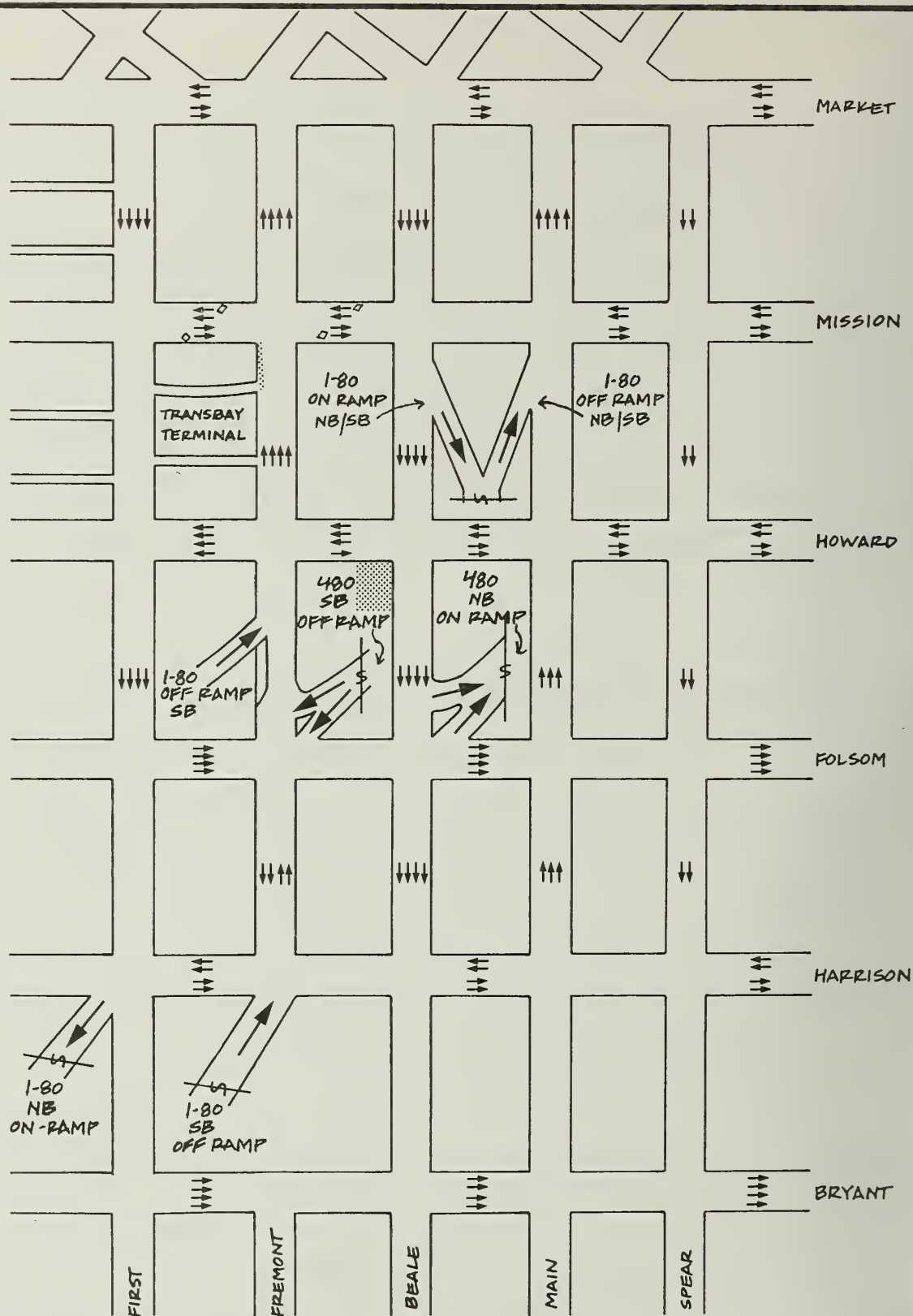
2. Street Network and Traffic Conditions

The 7 freeway ramps in the general area of the project site are shown in Figure 13, page 30. Two of these ramps serve the Embarcadero Freeway (Interstate 480) only; the remaining ramps connect into the Interstate 80/U.S. 101 freeway system (see Figure 2, page 11, for freeway locations).

Figure 13 also shows the general street network in the vicinity of the project site. Those streets specially designated in the Transportation Element of the San Francisco Comprehensive Plan are shown in Table 1, page 31.

Adjacent to the project site, Beale Street is a 4-lane, one-way southbound street with parking on both sides of the street. Howard Street between Beale and Fremont comprises one lane eastbound and 3 lanes westbound, with parking allowed on both sides of the street. West of Fremont, Howard Street becomes 4 lanes, one-way westbound.

Traffic volumes in the area are summarized in Table 2, page 32. Evening peak-hour traffic on Beale Street south of Mission is about 50% of levels north of Mission, reflecting the use of Beale Street as an access route to the freeway on-ramp at Mission and Beale. Between Mission and Howard streets, Beale



STREET NETWORK

LEGEND

- \diamond DIAMOND LANE : BUSES AND RIGHT TURNS ONLY, TAM-6PM
- NB NORTHBOUND
- SB SOUTHBOUND
- \rightarrow TRAFFIC LANE
- PROJECT SITE

NOT TO SCALE



Figure No.13

TABLE 1
MAJOR THOROUGHFARES AND TRANSIT PREFERENTIAL STREETS^{1/}

Major Thoroughfares ^{2/}	Transit Preferential Streets ^{3/}
Market Street	Market Street
Howard Street	Mission Street
Beale Street	First Street
Main Street	Fremont Street
Folsom Street	Stueart Street
Stueart Street	

1/ As designated in the Transportation Element of the City of San Francisco Comprehensive Plan.

2/ Major thoroughfare defined as "... a cross-town thoroughfare whose primary function is to link districts within the City, and to distribute traffic from and to the freeways, a route generally of city-wide significance..."

3/ Transit preferential street defined as "... a street where priority is given to transit vehicles over automobiles."

TABLE 2
EXISTING TRAFFIC VOLUMES

Street	24-Hour	P.M. Peak Hour ^{4/}
Beale - south of Market	NA	1,120 ^{1/}
Beale - north of Howard ^{3/}	NA	570
Beale - south of Howard ^{3/}	NA	310
Howard - at Spear ^{2/}		
eastbound	2,750	300
westbound	5,040	600
Howard - east of Beale ^{3/}		
eastbound	NA	100
westbound	NA	1,090
Howard - west of Beale ^{3/}		
eastbound	NA	60
westbound	NA	1,320

Sources: 1/ City and County of San Francisco Traffic Counts, 1/23/78.

2/ City and County of San Francisco Traffic Counts, 7/25/78.

3/ Alan M. Voorhees & Associates Traffic Counts, 4/12/79.

4/ 4:30 to 5:30 p.m.

NA = not available

NOTE: The mix of counts made at various times is justified by the fact that levels of traffic in this area change by less than 10%. A comparison of 1976 and 1978 counts on Beale Street indicates that the annual change is less than 5%.

TABLE 3
PARKING SUPPLY AND DEMAND IN AREA OF PROJECT SITE^{1/}

Parking Type	Number of Spaces	Number Occupied	% Occupancy
On-Street			
Time Limit	428 ^{2/}	405	95%
Unlimited	231	200	87%
Subtotal	659	605	92%
Off-Street			
Hourly/Daily only	1184	1062	90%
Monthly only	18	11	61%
Daily/Monthly only	570	532	93%
Subtotal	1772	1605	91%
Total	2431	2210	91%

^{1/} Parking survey conducted by Alan M. Voorhees & Associates, April 12, 17, 19, 1979 between 2 p.m. and 4 p.m. Survey area bounded by Mission Street, Bryant Street, First and Main Streets.

^{2/} 255 spaces are metered, 1 hour and 2 hour time limits.

Street is estimated to be operating at about 25% capacity during the peak hour.¹

Evening peak-hour traffic on Howard Street at the project site is predominantly westbound. Between Main and Beale streets, Howard Street westbound operates at about 80% capacity during the peak hour. In the eastbound direction, the single lane of Howard Street between Fremont and Beale operates at about 10% capacity in the peak hour.

3. Parking Conditions

The proposed project site is in the parking belt area to the south of the downtown, designated in the Transportation Element of the Comprehensive Plan. The parking belt is defined in the Comprehensive Plan as "an area appropriate for short-term parking facilities to replace spaces removed from the core area; located and designed to intercept vehicles entering downtown from major thoroughfares before they reach the downtown core automobile control area."

In the area of the project, there is on-street and off-street parking serving the immediate area and the southern part of the downtown financial district. A parking survey was conducted² over the 12-block area surrounding the project site and bounded by Mission Street to the north, Bryant Street to the south, First Street to the west, and Main Street to the east (see Figure 14). The results of this survey are summarized in Table 3, page 33.

Of a total 2,431 parking spaces in the survey area, 659 are on-street and 1,772 are in off-street lots. During the survey, overall occupancy levels, at just over 90%, were

¹See Appendix A-2, page 167.

²Survey conducted by Alan M. Voorhees & Associates, 12 (Friday), 17 (Wednesday), and 19 (Friday) April 1979.

found to be identical for both on-street and off-street parking spaces, resulting in about 55 vacant on-street spaces and 165 vacant off-street spaces in the survey area. Similar parking occupancy levels have been identified for the general area south of Market Street in 2 previous studies.

(1) The Final Environmental Impact Report for the Pacific Gateway Office Building Project¹ identified 4,260 off-street and 961 on-street parking spaces in the area bounded by Folsom, First, Front/California, and Steuart streets (see Figure 14, page 34). Occupancies of 90% to 100% for the off-street and 85% to 95% for the on-street spaces were observed, although the report notes that these were probably above normal due to an AC Transit strike at the time.

(2) The Final Environmental Impact Report for the 101 California Street project identified 5,880 off-street, long-term parking spaces, with a 90% occupancy rate (or about 570 vacant spaces), in an area defined by Market Street, the waterfront, Second and Folsom streets (see Figure 14).²

The results of these two studies support the findings of the parking survey conducted for the 315 Howard Street Building and indicate that the parking occupancy levels of city blocks adjacent to the 315 Howard parking survey area are relatively homogenous.

4. Existing Transit Conditions

a. San Francisco Municipal Railway

MUNI has 26 lines operating within a radius of about 1,500 feet from the proposed project site. They are the following

¹San Francisco Department of City Planning, Final Environmental Impact Report, Pacific Gateway Office Building Project, San Francisco, California, EE 78.61, 1979, p. 26.

²San Francisco Department of City Planning, Final Environmental Impact Report, 101 California Street Project, San Francisco, California EE 78.27, 1979, p. 44.

(Figure 15 shows the routes in the vicinity of the project):

- Market Street/Ferry Terminal Lines: 5, 6, 7, 8, 21, 31.
During peak periods only: 71, 72
- Cable Car at California and Market: 61
- Mission Street Lines: 9, 11, 12, 14, 14L, 14GL, 14X
- Cross Town Lines: 15/42, 41
- Gateway Express: 80
- Transbay Terminal: 27, 38, J, K, L, M, N.

Both sections of the 41 line -- the northern section operated by trolley coaches, and the southern section operated by motor coaches -- terminate adjacent to the project site on Howard Street east of Beale. Line 80, connecting the financial district, the Embarcadero BART station and the Southern Pacific Depot, passes in front of the project site along Beale Street in the southbound direction, and one block away in the northbound direction. In addition to the Market Street streetcars, MUNI Metro lightrail vehicles will provide transportation to the project area.

Based on the Recommended Maximum Passenger Load¹ for the vehicle types on each line, and on the average number of vehicles scheduled during the afternoon peak-hour, the total MUNI capacity provided to the project area is calculated to be about 26,000 passengers per hour.² Total ridership during the afternoon peak hour is estimated to be about 19,300 on the above lines, representing an average volume/capacity ratio of 0.74. This represents an average condition where all seats are occupied and there are about 8% standees. Note that these conditions vary from line to line. Lines 11 and 38 exceed the recommended maximum passenger load. Lines 14, 14GL, 14X, and 80 operate within 10% below the recommended maximum passenger

¹Represents the maximum number of passengers on-board a vehicle at a minimum level of comfort. This load is less than the maximum passenger load than can be accommodated under "crush" conditions. San Francisco Municipal Railway 5-year Plan 1979-1984, page 20.

²See Appendix A-1, page 166.

TRANSIT ROUTES

NOT TO SCALE




- LEGEND**
- | | | | |
|---|---------------------|---|----------------------|
|  | MUNI ROUTE |  | PROJECT SITE |
|  | MUNI ROUTE TERMINUS | | |
|  | GG TRANSIT ROUTES |  | CALIF. ST. CABLE CAR |
|  | BART STATION | | |

Figure No.15

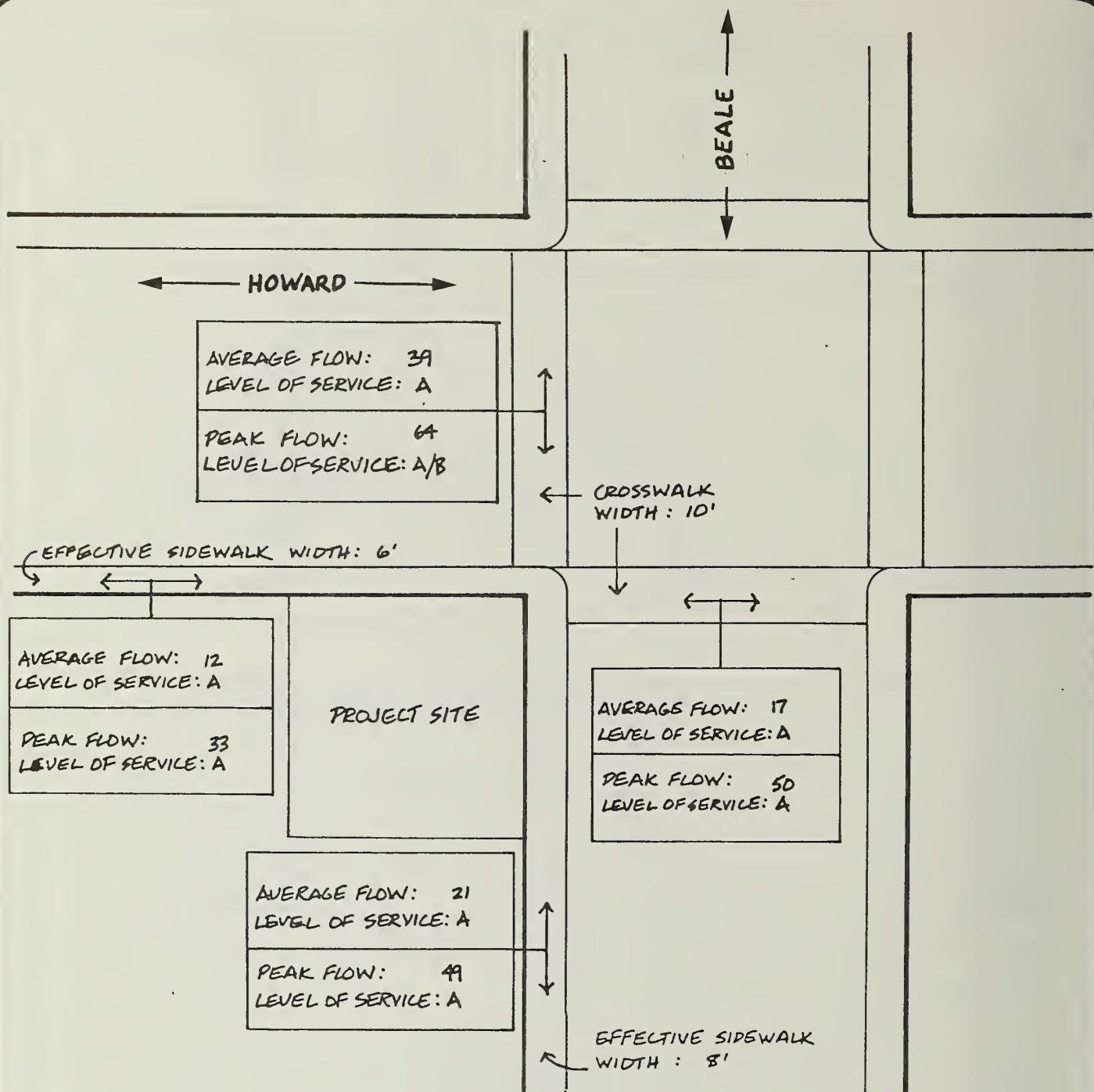
load. See Appendix A for details and calculations of capacities, ridership and volume/capacity ratios on MUNI lines.

b. Regional Transit

Public Transportation to the East Bay is provided by BART, AC Transit and Greyhound. The project site is about one-half block east of the TransBay Terminal, where all transbay lines operated by AC Transit terminate. The Embarcadero BART station is 2 blocks north of the project site. Greyhound operates its commute routes from Contra Costa County into the TransBay Terminal. The other Greyhound routes terminate at the Greyhound bus depot on Seventh Street between Market and Mission, about 7 blocks west of the project site.

Transit service to the Peninsula is provided by BART (to Daly City terminal Station), SamTrans and the Southern Pacific Railway. SamTrans provides bus service throughout San Mateo County and part of Santa Clara County and terminates its San Francisco lines at the TransBay Terminal, 1 block west of the project site. Southern Pacific provides a commute railroad service along the eastern part of the Peninsula between San Jose and San Francisco. Its trains terminate at the SP Depot at Fourth and Townsend, about 9 blocks south of the project site.

The North Bay is served by Golden Gate Transit buses and ferries. The Golden Gate Transit Financial District Commuter Routes operate out of the TransBay Terminal, and the Civic Center Commuter Routes operate along Folsom Street (inbound) and Howard Street west of Fremont (outbound). Golden Gate Transit ferry service to Sausalito and Larkspur is available from the Ferry Building, about 6 blocks from the project site. Another ferry connection is provided by a private operator from the Ferry Terminal to the City of Tiburon.



NOTE:

- 1.) All flows are Pedestrians per 5-minute periods.
- 2.) Source: Count by Alan M. Vorhees & Assoc., 4:00-5:30 p.m., Thursday, 12 April, 1979.
- 3.) Level of Service descriptions are given in Appendix A-5, page 180.

PEDESTRIAN FLOWS (4:30-5:30 P.M.) P.M. PEAK HOUR - EXISTING

NOT TO SCALE



↔ Indicates pedestrian movement

Figure No.16

5. Pedestrian Conditions

Pedestrian conditions on the sidewalks and crosswalks adjacent to the project site were surveyed during the afternoon peak period.¹ Pedestrian flow levels based on 5-minute observation periods varied throughout the peak period. Observed flows shown in Figure 16, page 40, are thus presented for both the average condition and the peak condition during the afternoon peak hour (4:30 to 5:30). The average condition is representative of typical peak period flows, whereas the peak condition is more representative of surges in pedestrian volumes that inevitably occur at certain times for short intervals.

The highest pedestrian flows were observed on Beale Street and the Howard Street crosswalk. About 75% of pedestrians were observed walking in the southbound direction from the downtown to parking areas south of the project site. Flows on Howard Street and the Beale Street crosswalk were rather lower, with about 60% headed in the westbound direction.

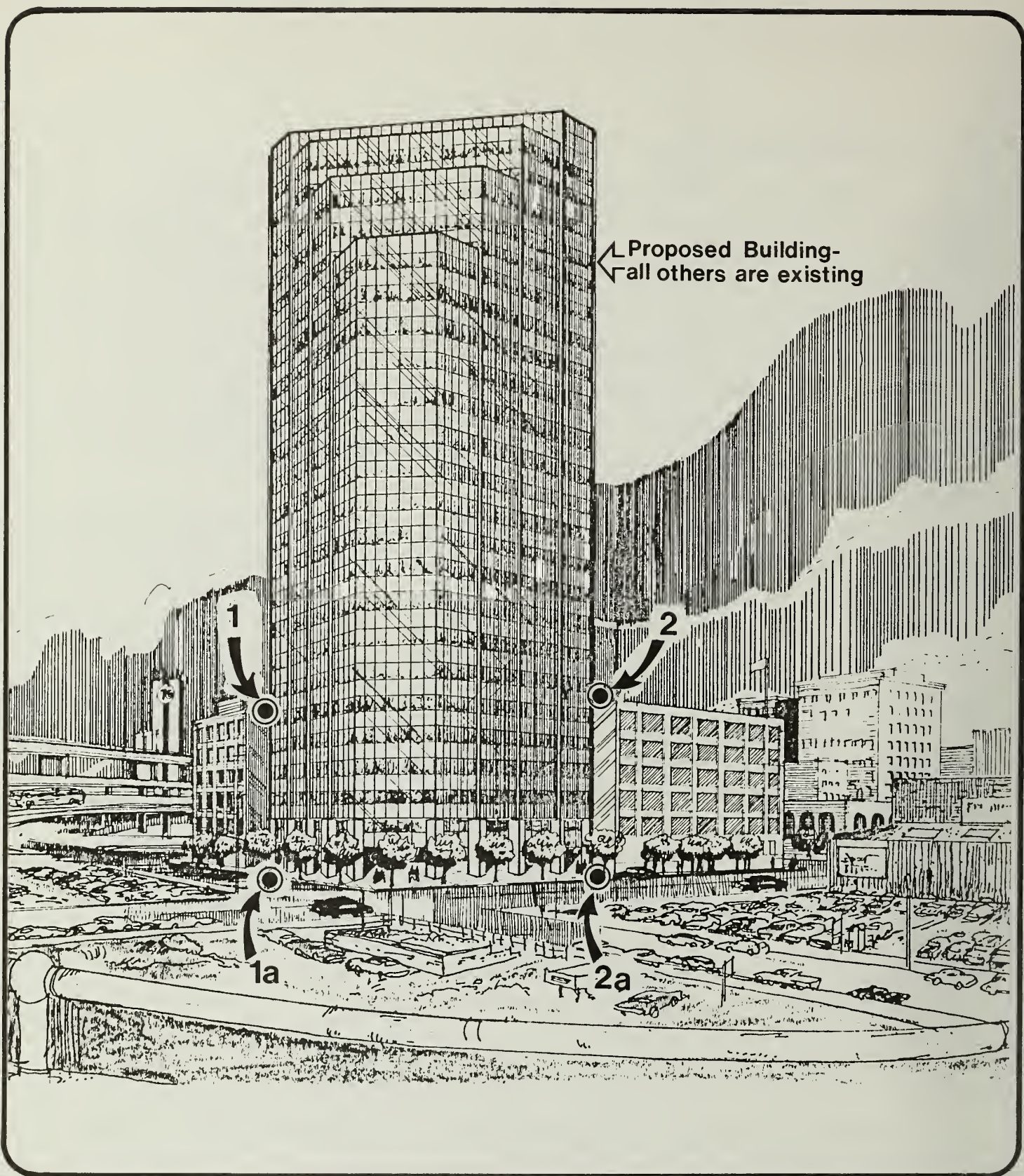
Observed pedestrian flows can be related to pedestrian level of service conditions by calculating the pedestrian flow in terms of persons per foot of effective sidewalk width per minute.² An explanation of pedestrian levels of service is given in Appendix A-5, page 182.

As shown in Figure 16, the sidewalks and crosswalks adjacent to the site are currently operating at level of service A under both average and peak conditions during the evening peak hour.³ The one exception is the Howard Street crosswalk, which operates at level of service A/B during short peak periods.

¹ Pedestrian survey conducted by Alan M. Voorhees & Associates, Thursday, 12 April 1979, 4-5:30 p.m.

² Effective sidewalk width represents the width of sidewalk available for pedestrian movement and excludes such impediments as poles, hydrants, signs, etc.

³ Crosswalk levels of service based on 17% pedestrian green time for Howard Street crosswalk and 25% pedestrian green time for Beale Street.



Noise Measurement Locations

Figure No.17

D. NOISE

The noise environment of the proposed 315 Howard Street Building site is dominated at ground level by traffic noise from Beale and Howard Streets and at upper levels from Beale Street, Howard Street, the freeway ramps and the Transbay Terminal bus ramps. To quantify the noise environment for the project site, noise measurements were made on Friday, 20 April 1979, between 8 a.m. and 10 a.m., at the 4 locations shown on Figure 17, page 42. Measurement positions 1 and 2 were on top of the existing 7-story 215 Fremont Building and were chosen as representative of the maximum noise exposure of the upper floors of the proposed office building.

The results of these measurements are shown in Table 4, page 44. The average noise level ranges from a L_{eq} of 66 dBA¹ at sites 1a and 2a to 70 dBA at site 1. The L_{eq} at site 2 was 67 dBA. During the measurement the major noise sources were trucks on Howard Street, Beale Street and the on-ramp to the freeway. Instantaneous maximum noise levels of up to 81 dBA were measured. These measurements corroborate the noise exposure levels given in the Transportation Noise Element of the San Francisco Comprehensive Plan. The Transportation Noise Element shows the project site to be exposed to 70-75 L_{dn} .²

¹The A-weighted sound level, expressed in dBA, is the sound pressure in decibels on the "A" scale. The "A" scale weights frequencies of sound to reflect the way people perceive sound. See Appendix B, Fundamental Concepts of Environmental Noise. (See also Table 5, page 45, for a comparison of typical sound levels measured in the environment and in industry.)

²The L_{dn} is the descriptor established by the U.S. EPA to describe the average day-night noise level with a weighting applied to noise occurring during the nighttime hours (10 p.m. - 7 a.m.) to account for the increased sensitivity of people during sleeping hours.

TABLE 4

NOISE MEASUREMENT DATA

(Sound Levels in dBA)

	Location	Day and Time	L ₁₀ *	L ₅₀	L ₉₀	L _{eq} **		Comments
1	Roof of 215 Fremont Bldg. on Beale St. side, 150(ft.) south of Howard St.	4/20/79 8:45-9:00 a.m.	73	70	68	70		Major noise sources: trucks and buses on freeway up-ramp; 73-76 dBA maximum
1a	Beale St., at back of sidewalk (future building facade) directly below Location 1	4/20/79 9:50-10:05 a.m.	69	64	62	66		Major noise sources: trucks and buses on Beale St.; 75-80 dBA maximum
2	Roof of 215 Fremont Bldg. on Howard St. side, 150 (ft.) west of Beale St.	4/20/79 9:00-9:15 a.m.	70	66	65	67		Major noise sources: trucks and buses on Howard St.; 72-75 dBA maximum
2a	Howard St. at back of sidewalk (future building facade) directly below Location 2	4/20/79 9:30-9:45 a.m.	68	63	60	66		Major noise sources: trucks and buses on Howard St.; 76-81 dBA maximum

*The sound level in dBA that was equaled or exceeded 10% of the time; L₁₀, L₅₀, and L₉₀ are the levels equaled or exceeded 10, 50 and 90% of the time, respectively.

**L_{eq} is the equivalent steady-state sound level that, in a stated period of time, would contain the same acoustic energy as the time-varying sound level during the same time period.

TABLE 5

Typical Sound Levels Measured
in the Environment and in Industry

	<u>Decibels, A-Weighted</u>	
Civil defense siren (100 ft.)	140	
Jet takeoff (200 ft.)	130	
	120	
Riveting machine	110	Rock music band
Emergency engine-generator (6 ft.) DC-10 flyover (700ft.)	100	Pile driver (50 ft.)
Subway train (20 ft.)	90	Boiler room Printing Press plant
Bus (50 ft.)		Garbage disposal in home (3 ft.)
Pneumatic drill (50 ft.)	80	Inside sport car, 50 mph
Freight train (100 ft.)		
Vacuum cleaner (10 ft.)	70	
Speech (3 ft.)	60	Auto traffic near freeway Large store Accounting office
Large transformer (200 ft.)	50	Private business office Light traffic (100 ft.) Average residence
	40	Minimum levels, residential areas in San Francisco at night
Soft whisper (5 ft.)	30	
Rustling leaves	20	Recording studio
	10	

Note: The distance in feet between source and listener is shown in parentheses.

E. CLIMATE AND AIR QUALITY

1. Climate

The climate of San Francisco is dominated by the breezes characteristic of marine climates. Because of this steady stream of marine air, there are few extremes of heat and cold. Temperatures exceed 90 degrees on an average of once a year and drop below freezing on an average of less than once a year. The warmest month is September, with an average daily maximum of 68 degrees Fahrenheit.

Winds in San Francisco are generally from a westerly direction and are persistent from May to August. During the rainy season (October to April), however, the strongest winds flow from the south, as well as from the west and northwest.

Wind tunnel tests of the proposed site as it exists now (see Appendix C, page 195) found the site to have low winds for the northwesterly direction because of the sheltering effect of upwind buildings and the TransBay Transit Terminal. Under westerly wind conditions, wind near the site ranged from a low relative strength of 7 to a moderate strength of 45 on a scale of 1 to 100.

The pedestrian sidewalks along the project site were found to be unshadowed in spring, summer and fall in the afternoon. In winter, shadows from existing structures affected the entire site. The combination of sunshine and low to moderate winds on the site indicate that the site currently has a low frequency of uncomfortable outdoor conditions.

2. Air Quality

San Francisco's persistent summer winds and its upwind position with respect to major pollutant sources continue to give it possibly the cleanest air in the Bay Area. Despite these advantages, there are periods, most often in fall and winter, when the air becomes stagnant. At these times the entire Bay Area has poor air quality.

The prevailing wind pattern in the Bay Area results in a deterioration of air quality east and south of San Francisco. Table 6 shows that, with the exception of nitrogen dioxide, areas downwind of San Francisco have more severe air quality problems. The main San Francisco monitoring site is at the Bay Area Air Quality Management District's offices at 936 Ellis Street, about 1½ miles west of the project site.

The data in Table 6 is representative of the project site except for carbon monoxide, which is strongly influenced by local traffic levels.

While San Francisco's air quality is better than most locations in the Bay Area, Table 6 shows that the state and federal standards are not met in the Bay Area. This has resulted in the development of an Air Quality Maintenance Plan (AQMP) for the Bay Area, as part of the Environmental Management Plan (EMP) prepared by the Association of Bay Area Governments (ABAG) and other governmental agencies.

The AQMP contains a strategy for the long-term attainment and maintenance of the air quality standards. The plan includes measures to reduce emissions from stationary sources and automobiles and proposed land use and transportation measures designed to reduce automobile use. The air quality problems addressed in the AQMP are photochemical oxidants and suspended particulates.

The Draft AQMP was adopted by the ABAG General Assembly in June 1978, and has yet to be adopted or approved by the U.S. Environmental Protection Agency.

In February 1979, the federal standard for oxidants was increased from 0.08 parts per million (all oxidants) to 0.12 parts per million for ozone only. This modification will have an effect on the AQMP, which is based on meeting the original standard.

TABLE 6

Number of Days Selected Pollutants
Exceeded State or Federal Standards, 1978¹

<u>Monitoring Site</u>	<u>Oxidant²</u>	<u>Nitrogen Dioxide</u>	<u>Carbon Monoxide</u>	<u>Suspended Parti- culates</u>	<u>Sulfur Dioxide</u>
San Francisco (Ellis Street)	4	4	1	1	0
Redwood City	6	0	2	4	0
San Jose	40	0	23	7	0
San Rafael	13	0	1	1	0
Fremont	38	0	0	10	0
Livermore	35	0	0	9	0

Source: Bay Area Air Quality Management District, Air Pollution in the Bay Area by Station and Contaminant, 1978, March 1979.

¹The State standards are specific concentrations and durations of air pollutants that reflect the relationship between concentration and undesirable effects. They are target values, and no timetable exists for their attainment. The Federal primary standards represent levels of air quality necessary for protection of public health, with an adequate margin of safety. The provisions of the Clean Air Act as amended require that by December 31, 1987 the Federal standards should not be exceeded.

²In early 1979 the U.S. Environmental Protection Agency adopted a new oxidant standard. The previous standard of 0.08 parts per million for all oxidizing substances was replaced by a standard of 0.12 parts per million for ozone alone, the most prevalent oxidant. The table reflects the old standard. It is not known as this time if the new standard will be retroactive.

F. GEOLOGY AND SEISMICITY

The project site is underlain by fill, sand and Bay muds.¹ The fill varies in thickness between 12 and 16 feet and consists of silty, gravelly sand, fine sand and clay; within the fill are found bricks and miscellaneous debris. Underneath the fill are younger Bay muds of varying thickness (from 7 to 20 feet). Underlying the younger Bay muds are areas of sand and sandy clay. About 75 feet below the surface are older Bay muds of considerable thickness (over 50 feet). The presence of these soft materials requires that piles be used for foundations. Bedrock was not encountered in the borings (to a depth of 180 feet) performed on the project site.

San Francisco is bounded by several active faults, including the San Andreas Fault about 6 miles to the west and the Hayward and Calaveras faults 15 and 25 miles, respectively, to the east. On 27 April 1979 an earthquake of magnitude 4.2 on the Richter scale² occurred along the San Andreas Fault and on 7 May 1979 an earthquake of Richter magnitude 4.8 occurred along the Calaveras Fault; no severe damage has been reported as a result of these events. On 6 August 1979, an earthquake occurred along the Calaveras Fault epicentered near Coyote Lake in Santa Clara County. The earthquake measured 5.9 on the Richter scale.³ The earthquake was felt in San Francisco as two distinct shocks lasting 5 to 10 seconds and 13 seconds, respectively. No damage occurred in San Francisco. In addition, an earthquake

¹Harding-Lawson Associates, Consulting Engineers and Geologists, Logs of Borings, 1, 2, 3, and 4, 301 Howard Street, Job #9763,001,04, 28 March 1979.

²Richter Scale: A logarithmic scale developed by Charles Richter to measure earthquake magnitude by the energy released, as opposed to earthquake intensity as determined by effects on people, structures, and earth materials.

³California Division of Mines and Geology, California Geology, November 1979.

along the Calaveras Fault, Richter magnitude 5.5, occurred on 24 January 1980, causing damage in the Livermore Valley; the shock was felt in San Francisco. On 26 and 27 January two more earthquakes in the Livermore Valley area occurred, causing damage in that region and resulting in groundshaking in San Francisco. The estimate of magnitude for the earthquake of 26 January varies, but it could have been as high as 5.9 on the Richter scale.

There are no active faults crossing the project site.¹

G. ENERGY

The proposed project would be supplied with electricity and natural gas by Pacific Gas and Electric Company (PG&E). Although PG&E has indicated that facilities of sufficient size exist in the project area and that no problems should be encountered in supplying the proposed project, a final decision on which facilities would actually supply the proposed project cannot be made until receipt by PG&E of plans for the proposed project.²

H. COMMUNITY SERVICES

1. Police

The proposed project site is subject to routine police patrol from squad cars along Beale and/or Howard Streets. No foot-patrols pass the site. The area is serviced from the Southern Station at 850 Bryant.

¹W.C. Jennings, Fault Map of California, California Division of Mines and Geology, 1975.

²Courtney Beck, Industrial Power Engineer, Marketing Department, PG&E, San Francisco Division, telephone conversation, 23 April 1979.

Six reported accidents occurred in the 5 years from 1974 to 1978, inclusive, at the Beale and Howard Street intersection.¹ By contrast, the more heavily traveled Howard and Fremont Street intersection was the location of 26 reported accidents during the same period.¹

Between April 1, 1978 and May 11, 1980 50 known crimes were committed on Howard Street between Beale and Fremont Streets. The crimes ranged from assault and robbery to grand theft from a locked automobile. The majority of known crimes committed were concerned with stolen automobiles and automobile stripping. During the above time period, 95 known crimes were committed of a similar nature on Fremont Street between Mission and Folsom Streets, and 118 known crimes were committed on Beale Street between Mission and Folsom Streets.²

2. Fire

The nearest fire alarm box to the proposed project is Box 2124 at the intersection of Beale and Howard Streets. Four stations of the San Francisco Fire Department are able to respond to calls from this box:

- Station 35, 3 blocks to the west of the proposed project at 676 Howard Street (1 to 2 minutes response time)
- Station 13, at 530 Sansome Street (4 minutes response time)
- Station 1, at 416 Jessie Street (3 minutes response time)
- Station 8, at Fourth and Bluxome Streets (3 minutes response time)

¹Stan Chin, Civil Engineer Assistant II, Division of Traffic Engineering, San Francisco Department of Public Works, telephone conversation, 20 April 1979.

²Basic data supplied by the San Francisco Police Department, Jmaes P. Shannon, Deputy Chief of Police Administration, correspondence of 12 May 1980.

The response time shown from these 3 stations to the proposed project site are average times and would vary depending on the time of day, traffic conditions, weather and other factors affecting travel on the streets.¹ High pressure lines for fire fighting are located on all blocks surrounding the project site.¹

3. Water

A 12-inch low pressure water main runs along the east side of Beale Street, and an 8-inch low pressure main is on the north side of Howard Street. These mains interconnect at the Howard/Beale Street intersection.²

4. Sewer

Two major sewer lines could serve the proposed project: A 15-inch line runs along Beale Street, and a 3-by-5-foot brick sewer tunnel is located under Howard Street.³ Both lines carry wastewater flows to the Northpoint Water Pollution Control Plant. A sewer connection permit has been issued for the project.

I. ECONOMICS

1. Economic Activity and Employment

The proposed project site is owned by Paladin N.V.,⁴ a company based in Paris, France. Paladin N.V. purchased the site and the adjacent 215 Fremont Street property from Continental

¹Eugene Anderson and Chief Robert Rose, Division of Planning and Research, San Francisco Fire Department, telephone conversation, 29 April 1980, and 5 May 1980.

²Harlow Swain, District Water Serviceman, San Francisco Water Department, telephone conversation, 30 April 1980.

³Nat Lee, Engineering Associate, Division of Sanitary Engineering, San Francisco Department of Public Works, telephone conversation, 20 April 1979.

⁴Dutch naamlove vernootschap, 'incorporated'; this is the name under which the corporation is registered in the United States.

Development Corporation in 1978.¹ Continental Development Corporation is the building manager for 215 Fremont Street and would be the construction, leasing and building operations manager for the proposed project.²

A gasoline service station on the site is no longer operating, although pumps and underground storage tanks remain. A portion of the site is currently leased to Pacific Telephone and Telegraph Company for parking and van loading (see Section II.B, Land Use, page 26). The remainder of the site has been rented out since February 1979 by Continental Development Corporation directly to 13 users for monthly auto parking.

Existing employment adjacent to the site at the 316,400-gross-square-foot 215 Fremont Street Building totals about 1,200, for an employee density of 1 employee per 264 gross square feet. Tenants are the United States Environmental Protection Agency (400 employees), Pacific Telephone Co. (600 employees). Continental Development Corporation (10 employees), and the California Culinary Academy (200 employees, students and instructors).³

2. Fiscal Considerations

a. Revenues to City

The 1979-1980 assessed value of the project site (Assessor's Parcel 25-3738-001) was \$481,075. At the 1979-1980 composite tax rate of \$4.97 per \$100 of assessed value, the site generated \$23,900

¹In 1973, the property was sold by Del Monte Corporation to Continental Airport Center, Inc., which merged with Continental Development Corporation in 1977.

²CDC has been appointed the construction, leasing and building operations manager by the project owner, 301 Howard Street Associates, which is a joint venture partnership, equally owned by CDC through a wholly owned subsidiary and by Paladin, N.V.

³W. Gene Mays, Senior Vice President, Continental Development Corporation, telephone communication, 5 April 1979.

in property taxes during the fiscal year.¹ These were distributed to: the City and County of San Francisco (85%, about \$20,300); the San Francisco Unified School and Community College Districts (8.8%, about \$2,100); BART (7%, about \$1,670, for bond payments only), and the Bay Area Air Quality Management District (.2%, about \$48).

b. Cost of City Services

It is not possible to quantify costs of City and County services to the site because the City and County of San Francisco does not have a method by which to estimate the cost of public services attributable to commercial development on either a per-acre or per-employee basis. These services include fire and police protection, street lighting and cleaning and street and storm drain maintenance. Existing costs attributable to the site may be covered by the revenues in this fiscal year.

J. HISTORICAL

The original shoreline of Yerba Buena Cove was southwest of the present intersection of Beale and Howard Streets.² The 1859 U.S. Coast Survey Map shows the proposed project site filled, but undeveloped. The Sanborn Insurance Company map of 1887 shows the project area occupied by lumber companies, but shows no named building on the project site. In the 19th century the filled portions of Yerba Buena Cove which lay behind the

¹Of the total tax, \$3,600 represents the maximum allowable under Proposition 13 for general government expenditures (\$4 per \$100 assessed valuation), and \$954 was levied to finance bond obligations previously approved by the general electorate (\$1.06 per \$100 assessed valuation). The figures shown do not include revenues from the 215 Fremont Building on the remainder of the site.

²U.S. Coast Survey Maps, 1853 and 1859; rare maps contained in the Bancroft Library, University of California, Berkeley, California, no other source known. Photographic reprints are available to the public through Bancroft Library.

Steuart Street docks and other major street-end docks such as Howard, Harrison, Beale, and Spear Street were built up with iron foundaries and structures used by the lumber companies. There would also have been various 'support' businesses in the area, including some lodging, suppliers, saloons, etc. This situation was more or less constant after the turn of the century. The first record of a named building on the site is of a 3-story brick building housing the Masrick Fruit Company constructed in 1918.¹ It is possible that this was the first replacement for whatever structure may have been destroyed at the project site by the 1906 fire.

The Masrick building occupied the site until 1948 when it was listed on a building permit for alterations as a 3-story warehouse owned by Butler Bros.¹ In 1950 a permit was granted to build a 1-story service station for the Signal Oil Company;¹ this is the last entry in the San Francisco Bureau of Building Inspection record.

¹Building permit record, available at the San Francisco Department of Public Works, Bureau of Building Inspection.

III. ENVIRONMENTAL IMPACTS

A. VISUAL QUALITY AND URBAN DESIGN

The proposed structure would be 24 stories in height, rising to 320 feet at the top of the mechanical penthouse (see Figure 7, page 18). The building would be set back 10 feet from exterior walls of the adjacent 215 Fremont Building. A principal architectural feature of the building would be setbacks on the upper floors to form terraces which would be at an angle to the Howard and Beale Street facades (see Figure 3, page 14). The 23rd-floor terrace would be used as an outdoor observation deck by the tenants. The observation deck would have a container garden of small trees and shrubs. The north corner of the proposed building would be set back about 30 feet from the curblin at the intersection of Howard and Beale Streets, forming a building face at an angle to the Howard and Beale Street facades (see Figure 3). Visually, the effect would be to orient the building to the corner of the intersection. The sides of the building fronting Howard and Beale Streets would be stepped inward incrementally at each perimeter vertical column supporting the building as the street intersection is approached reducing the apparent bulk of the project. Visual interest to pedestrians would be provided through textured surface paving following the layout pattern of the vertical columns that would be visible at ground level (see Section I.C, Project Characteristics, page 13, for a discussion of the ground level lobby). Surface paving would consist of concrete, brick or other material. Street trees would be provided near the building's perimeter as a part of the pedestrian environment (see Section IV.D, Mitigation, Climate and Air Quality, page 126).

All major mechanical equipment (such as electrical controls, ventilating equipment and pipes) would be enclosed within the building walls, including a covered mechanical penthouse above the 24th floor. Mechanical equipment required to operate the service elevator may project about 3 feet above the penthouse in a separate enclosure.

Policies contained in the Urban Design Element of the San Francisco Master Plan,¹ relate to the project area and the proposed building structure. The Urban Design Plan is meant to serve as a guide to new development, so that the physical environment would not be abruptly or severely disrupted.

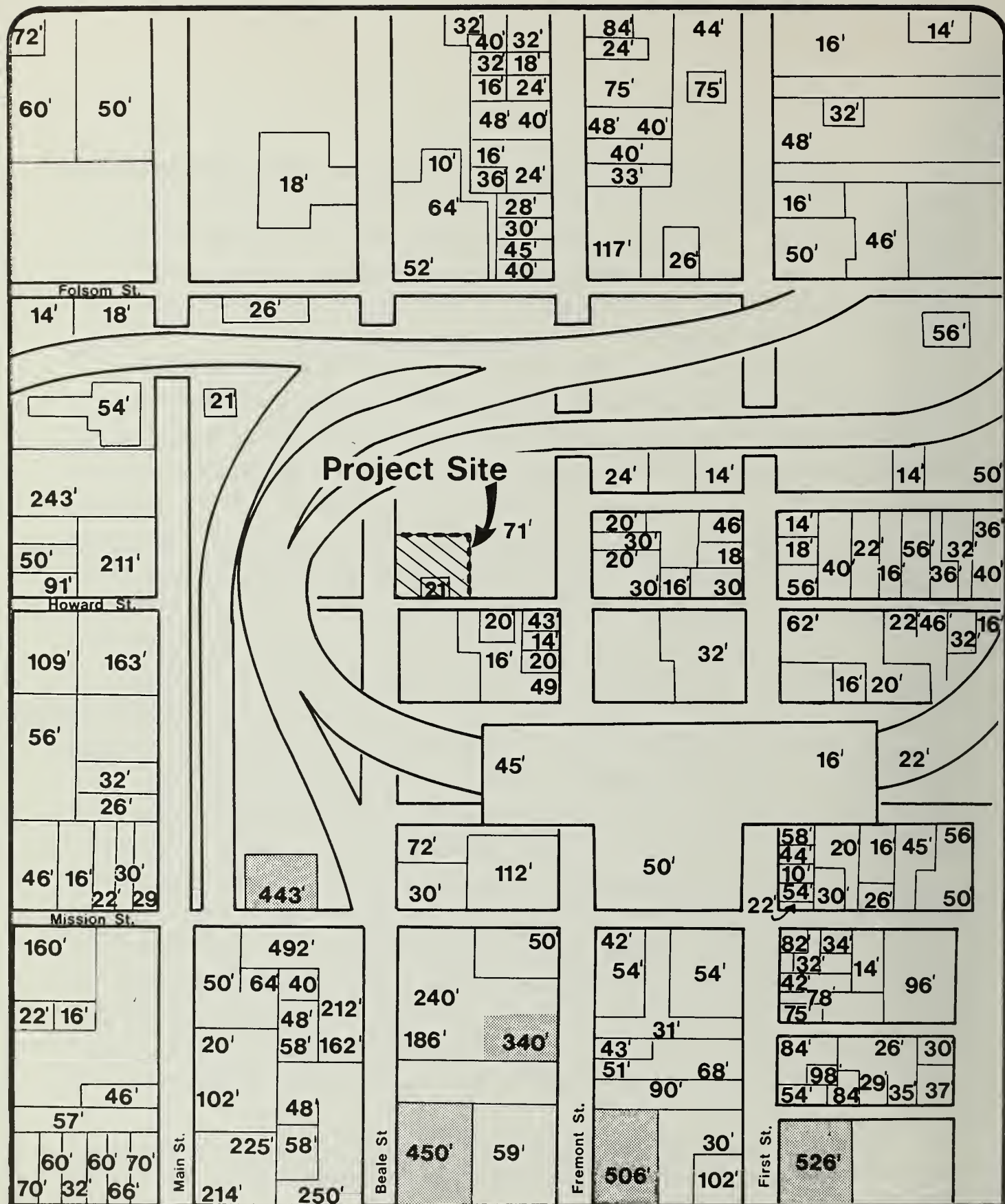
Major New Development Policy 6: "Relate the bulk of buildings to the prevailing scale of development to avoid an overwhelming or dominating appearance in new construction."²

The building's bulk, derived from its height and width,³ would be similar to building structures beyond about a 2-block radius of the project site to the east and north, partially conforming to Major New Development Policy 6 (see Figure 18, page 58). Figure 19, page 59, shows a pedestrian view of the proposed building as seen from the east side of Beale Street at the base of the Transbay Terminal entrance ramp. The structure would be visible from out-lying vantage points including the Bay Bridge, Twin Peaks, Bernal Heights and Potrero Hill (see Figures 20, 21, 22, 23, pages 61, 62, 63, and 64). When seen from Twin Peaks, the top of the structure would partially obstruct views to Yerba Buena Island. The project's bulk would be similar to other structures defining the urban skyline. From Bernal Heights, the building would blend into the urban skyline provided by buildings in the background.

¹San Francisco Department of City Planning, adopted by Resolution 6745 of the San Francisco City Planning Commission, 26 August 1971.

²Urban Design Plan, p. 37.

³The structure would measure 320 feet in height and about 128 feet on a side.

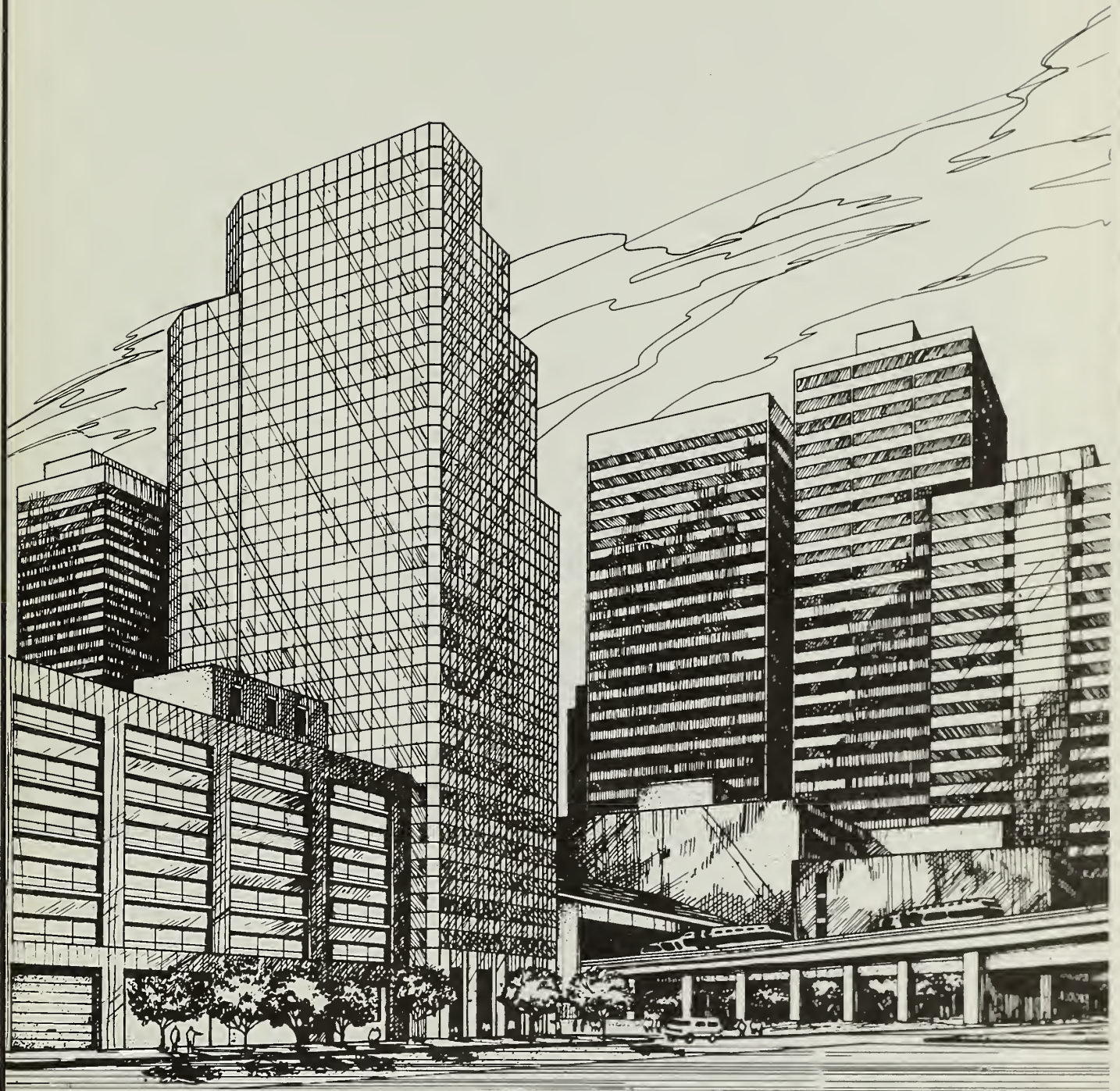


Heights of Surrounding Buildings

■ Buildings taller than the proposed structure at 315 Howard.

Not to Scale

Figure No.18



Perspective Drawing of Proposed Building
(View toward Project Site from East side of Beale Street
at base of freeway on-ramp)

Figure No.19

Viewed from Potrero Hill, the building would be seen against the background of existing buildings and not alter the skyline. Near the west end of the Bay Bridge, the south face and top of the structure would be seen above buildings east of the project site, increasing the height of the skyline. The building's bulk would be compatible with structures in the foreground.

City Pattern Policy 1: "Recognize and protect major views in the City, with particular attention to those of open space and water."¹

The proposed project would partially conform to City Pattern Policy 1 because the obstruction of views to the surrounding landscape from other buildings would not be expected to occur; views from other buildings are already confined by elevated roadways encircling the project area and adjacent structures. Cumulatively, the structure would contribute to the total mass of buildings blocking views to the Bay from hillside locations (see Figures 21, 22 and 23, pages 62, 63, and 64). The degree of view blockage would vary with respect to the location of the observer. The building's presence would occasionally be emphasized by a low sun reflecting off the building's glass exterior; (see Appendix E, page 215. An Investigation of Sun Reflection Effects on Vehicle Drivers for the proposed 315 Howard Street Building).

It is anticipated that upper floors of the proposed structure would provide views of San Francisco Bay, Treasure Island, the East Bay hills, and the San Francisco skyline.

Major New Development Policy 2: "Avoid extreme contrasts in color, shape and other characteristics which will cause new buildings to stand out in excess of their public importance."²

The building would be clad in Solarcool Gray glass, or a similar reflective tinted glass³ The glass would contain

¹Urban Design Plan, p. 10.

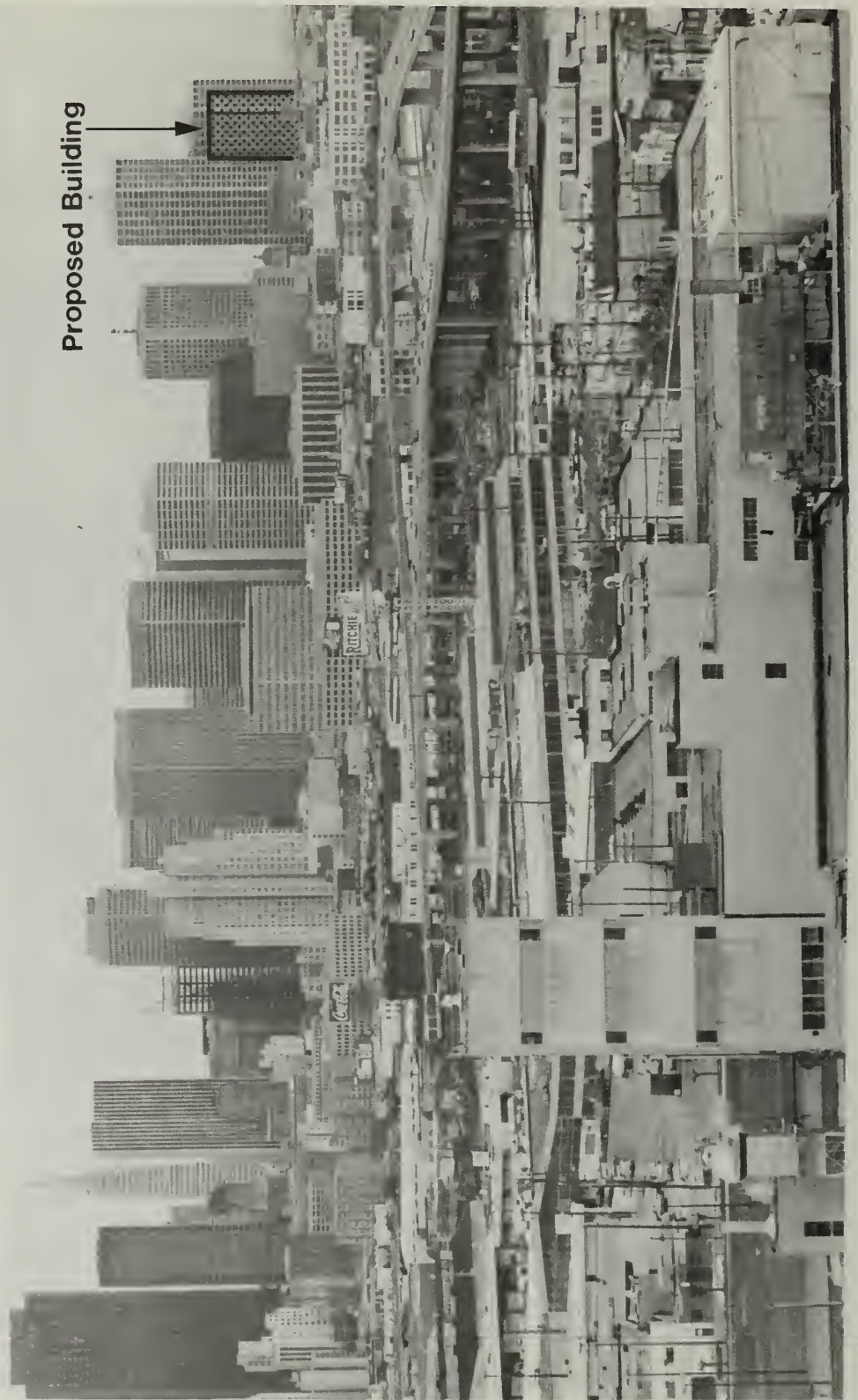
²Urban Design Plan, p. 36.

³Solarcool is a registered trademark of PPG Industries, Inc.



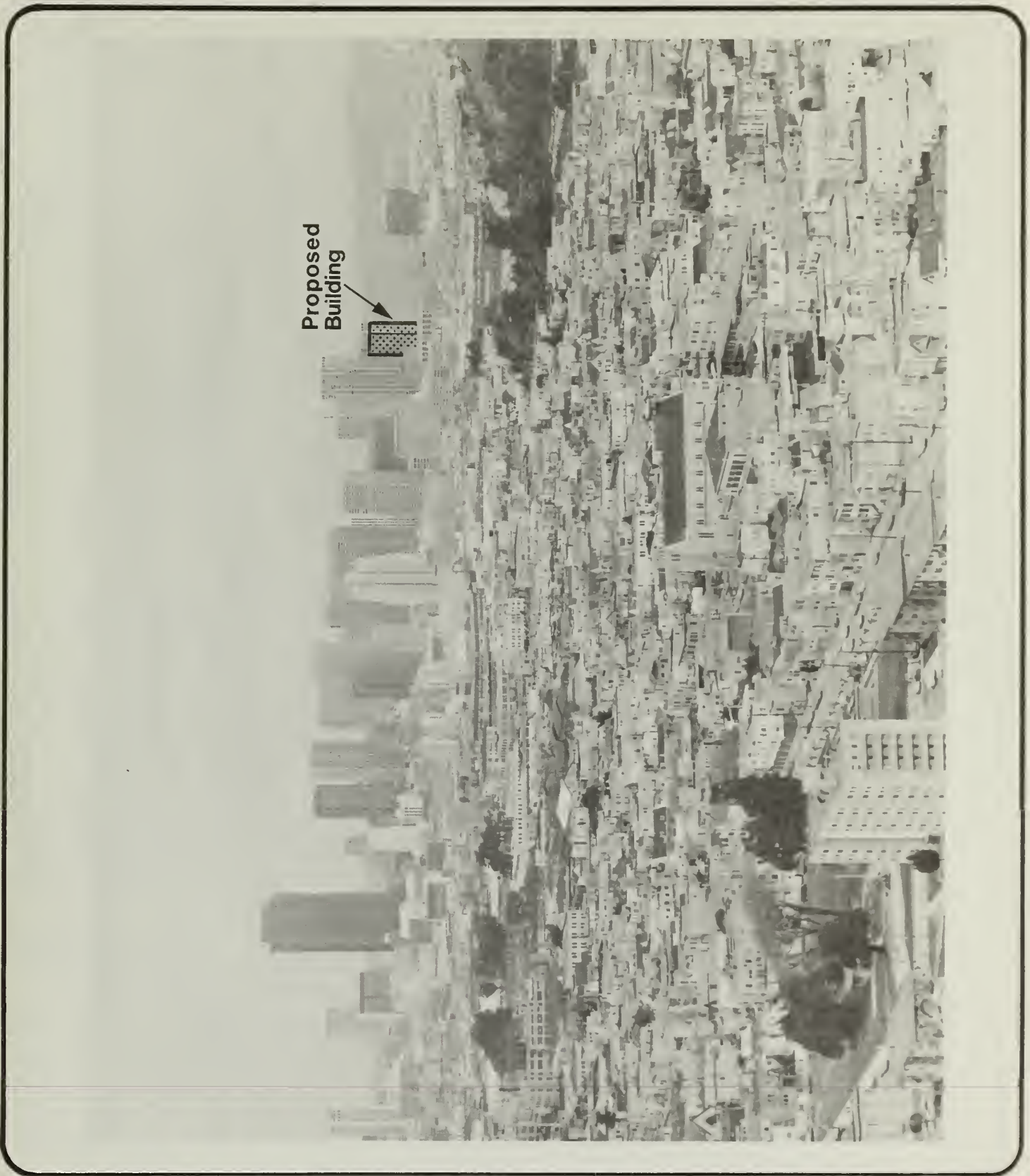
**View toward Project Site from West End
of Bay Bridge Span**

Figure No.20



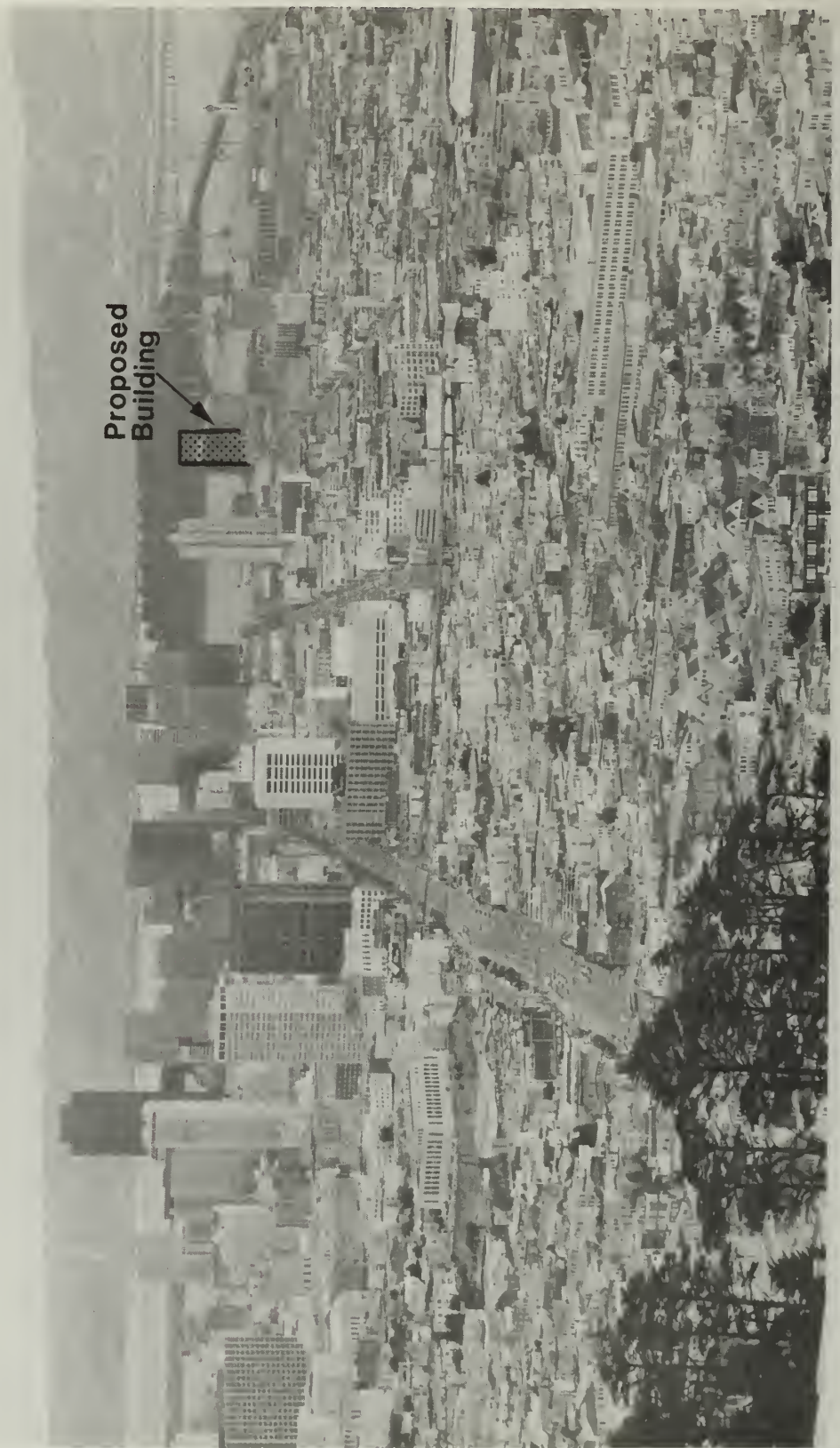
**View toward Project Site from
Potrero Hill**

Figure No.21



**View toward Project Site from
Bernal Heights**

Figure No.22



View toward Project Site from Twin Peaks

Figure No.23

a chromium oxide fused to its surface with the glass interior tinted a light gray.¹ The spandrel² facing would be either the same type of glass or glass of a slightly different tint and/or reflectivity. Clear glass would be used in the ground level lobby and second floor.

From the outside, a viewer (pedestrian, vehicle driver, viewer from a nearby building) would not normally be able to see partially into the building during daylight hours. The building would conform to Major New Development Policy 2 because the structure's outward appearance would be relatively neutral, reflecting (close to their true colors and forms) the light qualities and physical characteristics of the sky and adjacent structures.³ Light would be reflected to the ground level pedestrian environment to a greater degree than if granite, concrete or other material were used on the building's exterior. At night, interior lighting would allow the viewer to see clearly into the building.

City Pattern Policy 3: "Recognize that buildings, when seen together, produce a total effect that characterizes the city and its districts."⁴

Major New Development Policy 9: "Encourage a continuing awareness of the long-term effects of growth upon the physical form of the city."⁵

¹Steve Traeger, Sales Representative, PPG Industries, Inc., telephone communication, 2 May 1979.

²Spandrel: In a multistory building, a panel-like area between the top of a window on one level and the sill (base) of a window in the story above.

³Steve Traeger, Sales Representative, PPG Industries, Inc., telephone communication, 2 May 1979. Clear glass reflects 8% of the light that strikes it, Solarcool Gray, 35%. Applications of Solarcool glass may be seen on the Crocker Bank-Computer Center, San Francisco, and the Interland Building, San Mateo.

⁴Urban Design Plan, p. 10.

⁵Ibid., p. 40.

The proposed structure would relate to City Pattern Policy 3 and Major New Development Policy 9 in terms of cumulative impacts. As noted, the building would be seen from overhead freeways and other elevated vantage points throughout the area. It would be seen as a new structural element taking its place in the City's emerging downtown urban form comprised of taller buildings over an increasing land area. The structure would be seen as an element tapering downward the higher skyline along Market Street and the Financial District outward toward the edge of the downtown urban area (see Figures 21, 22 and 23, pages 62, 63 and 64).

Current trends indicate that future development of land adjacent or close to the project site would consist of buildings taller than the existing older structures they would replace. New structures would be seen to extend the existing highrise development pattern north and east of the project area, closer to the project site. Accordingly, the proposed structure would be visually absorbed, in varying degrees through time, into the skyline profile of the City landscape.

B. LAND USE

Approximately 367,000 gross square feet of office space would replace the present uses on the site (see Section I.C, Project Characteristics and Scheduling, page 13). The existing gasoline service station, including pumps and underground storage tanks, would be removed to make way for the project. Although tenants of the building are unknown at this time, a permanent occupancy of about 1,240 to 1,630 persons would be expected (see Section III.I, Economics, page 111). During construction a peak employment of 300 persons would be anticipated.¹

The project would increase the availability of office space in the area south of Market Street and thus continue a

¹Allerton Blake, Project Manager, Continental Development Corporation, written communication, 22 March 1979.

trend towards such construction in the area which has occurred over the last 20 years. Some secondary impacts, such as development of retail commercial and service related establishments, including restaurants, may occur as a result of the market generated by additional employment in the area (see Section III.K, Growth Inducements, page 117).

C. TRANSPORTATION¹

1. Framework of Transportation Impact Analysis²

The transportation impacts have been assessed for the year 1982 when it is expected the proposed 315 Howard project

¹Since preparation of the Preliminary Draft EIR, changes have occurred in the quantity of net leasable space. Net leasable has been adjusted downward, therefore impacts shown are worst-case conditions.

²ABAG's Projections '79 are the latest projections in the agency's continuing series of forecasts for the Bay Area. The projections apply a series of demographic, economic, development policy and transportation assumptions to describe future population, employment and land-use conditions in the 9-county bay area. Using 1975 data as a base, the projections are calculated for 5-year intervals from 1980 to the year 2000.

The comment raised during the public hearing on the Draft EIR on the proposed Daon Building (Draft EIR for the proposed Daon Building, EE79.57, Public Hearing, Thursday March 20, 1980, Reporter's Transcript of Proceedings, page 8) refers to 10% of the future (additional) employment growth in San Francisco. These 10% do not apply to any particular building and they do not apply to 1982, the analysis year for the proposed 315 Howard Project. Even though the proposed project would represent an addition to the downtown office supply, its future employees would not necessarily represent new or additional employees to downtown. It is expected that a significant proportion of the future tenants and employees in the proposed project would shift from other locations in downtown San Francisco. These would be companies or agencies needing more office space or different office space. The proportion of net new employees that would be expected to occupy the 315 Howard Building by 1983 is estimated at about 15% to 20%, based on the proportion of total new office space as compared to the total amount of existing office space in Downtown San Francisco.

The most accurate methodology to assess the transportation impacts of a proposed project in Downtown San Francisco is therefore to use information on residential origins and travel modes derived from surveys of existing buildings. Existing surveys reflect more accurately travel behavior of project employees than would any forecasts regarding the residential origins of the new future employees.

would be operating. The analysis identifies the number of person-trips that would be added to all major travel modes due to the proposed project. Increased travel demands were estimated for an average weekday and for the afternoon peak period. Subsection 3 identifies the cumulative travel generation of a total of 21 downtown office projects that are under construction or that are proposed in the downtown area.

Subsections 4 through 8 will identify the anticipated impacts on each major travel mode. For each major mode, 1982 conditions without any of the projects are described first, then the impacts of the proposed 315 Howard Street project, and finally the cumulative impacts of all 21 projects, including the 315 Howard project, will be described.

2. Estimated Travel Generation of Proposed Project and Expected Travel Modes

The number of person-trips generated by the proposed project has been based on the following trip generation rates:

- 17.5 daily person-trips per 1,000 square feet of leasable office area
- 100 daily person-trips per 1,000 square feet of leasable commercial (restaurant/retail) area

Table 7, page 70, summarizes the daily and peak-hour trips that would be generated by the proposed project by all major travel modes. Assumptions and calculation details related to travel generation are included in Appendix A, page 163.

The proposed project would generate a total of about 6,200 person-trips (trip ends) on an average weekday. About 3,450 of these trips would be employee-generated commute trips, and 2,750 trips would be made for other purposes, such as business visits, running errands, lunch, deliveries, etc.

The most critical peak period in terms of transportation impacts is the afternoon peak hour, generally from 4:30 p.m. to 5:30 p.m. This peak hour could vary by about half an hour depending on the specific mode. The impact analyses in the following sections focus on the afternoon peak hour and assume

worst-case situations, in the sense that the peak-hour trips generated by the proposed project are added to the actual peak-hour volumes, whether they are from 4-5 p.m., 4:30-5:30 p.m., or from 5-6 p.m. A total of 1,250 person-trips would be generated by the proposed project during the afternoon peak hour.

3. Cumulative Travel Generation of Major Office Development in the Downtown Area

The cumulative impact analysis is undertaken with the assumption that the other office developments under construction or proposed in the San Francisco Downtown area would be similar to the proposed 315 Howard project in terms of travel generation rates, geographical distribution of generated trips and modal splits. This means that the cumulative impacts of the major projects are in direct proportion to the square footage of floor space. Table 8, page 71, shows those projects and their gross square footages that are assumed for the cumulative impact analysis. A total of 10,200,000 leasable square feet of office floor area would be added to downtown by 1982. This represents about 29.5 times more square feet than for the proposed 315 Howard project. The cumulative impacts of the above office developments would therefore be 29.5 times higher than for the 315 Howard project, or, in other words, the 315 Howard project represents 3.4% of all proposed office developments schedule for completion by 1982. Table 9, page 72, shows the additional travel volumes that would be generated by the 21 office development listed in Table 8. The 21 office developments considered have different characteristics because of the other uses that some of them include, such as retail, restaurant or residential uses. Because of the secondary nature of these uses in terms of travel generation, the cumulative impact methodology used for this study affects the travel generation results by less than 10%. The 2 left-hand columns of Table 9 show the cumulative travel impacts

TABLE 7

ESTIMATED TRAVEL GENERATION OF PROPOSED PROJECT^{1/}

Mode of Travel	Employee Commute Travel				Non-Commute Travel				Total Travel		
	% Modal Split	Average Weekday Trips	PM Peak-Hour Trips ^{2/}	% Modal Split	Average Weekday Trips	PM Peak-Hour Trips ^{3/}	% Modal Split	Average Weekday Trips	PM Peak-Hour Trips ^{3/}		
Car drivers	26%	898	225	41%	1128	113	33%	2026	338		
Car passengers	5%	173	43	4%	110	11	4%	283	54		
MUNI	32%	1105	332	27%	743	74	30%	1848	406		
BART	17%	587	176	5%	138	14	12%	725	190		
AC Transit	8%	276	83	0.4%	11	1	5%	287	84		
Golden Gate Buses	5%	173	52	0.4%	11	1	3%	184	53		
Southern Pacific RR	4%	138	41	0.5%	14	1	2%	152	42		
Greyhound, charters, jitneys	3%	104	31	1%	28	3	2%	132	34		
Walk	3%	104	26	22%	605	61	11%	709	87		
Ferries	2%	69	21	-	-	-	1%	69	21		
SAMTRANS	1%	35	11	0.2%	6	1	1%	41	12		
Total with Transfers	106%	3662	1041	101.5%	2794	280	104%	6456	1321		
Total without Transfers	100%	3452	978	100%	2752	276	100%	6204	1254		

^{1/} See Appendix A-3, page 170, for assumptions and calculation details.

^{2/} Generally from 4:30-5:30 p.m. Assumes a 30% peak factor for all transit modes and a 25% peak factor for auto and walk modes. For definition of "peak factor", see Appendix A, page 166. The peak factor for auto and walk modes is lower than that for transit because auto travel is more spread out over the peak period. Estimates by Alan M. Voorhees and Associates.

^{3/} Assumes a 10% peak factor for all modes. Estimate by Alan M. Voorhees & Associates.

TABLE 8
DOWNTOWN SAN FRANCISCO OFFICE
DEVELOPMENTS UNDER CONSTRUCTION
OR PROPOSED. TO BE COMPLETED BY 1982

Estimated Year of Completion	EIR File Number	Building Location	Total Leasable Sq. Footage
1979	76.162	180 Montgomery	359,000
	77.157	201 California	247,000
	74.140	180 Howard	191,000
	75.60	505 Sansome	175,000
1980	74.322	595 Market	398,000
	74.224	333 Market	1,138,000
	76.434	601 Montgomery	248,200
	74.253	444 Market	728,200
	78.61	201 Mission	572,000
1981	none	IV Embarcadero	840,000
	79.57	Daon Bldg. (Battery & Sacramento)	236,800
	78.413	150 Spear Street	265,000
	79.169	Pacific Lumber Bldg. (Washing- ton & Sansome)	101,300
	77.164	Pacific Bldg III	296,000
1982	78.27	101 California	1,288,600
	77.256	Levis Plaza	825,000
	78.207	Federal Reserve Bank	460,000
	78.298	1 Montgomery	654,000
	78.334	1 Sansome	680,000
	79.178	456 Montgomery	147,400
	79.196	315 Howard	345,200
TOTAL	1979 - 1982		10,195,700

Compiled from:

- 1) Memo to Selina Bendix, Environmental Review Officer, from Chi-Hsin Shao, Center City Circulation Program, dated 4 September, 1979. "A Proposed EIR Format for Transportation Impact Analysis," Attachment 2.
- 2) San Francisco Department of City Planning, Final Environmental Impact Report, Proposed Pacific Gateway Office Building Project, EE 78.61, Certification Date 26, July 1979.

TABLE 9

CUMULATIVE TRAVEL GENERATION OF DOWNTOWN
SAN FRANCISCO OFFICE DEVELOPMENTS UNDER
CONSTRUCTION OR PROPOSED,
TO BE OCCUPIED BY 1982

Mode of Travel	Alan M. Voorhees Estimates of Total Person-Trips Generated during		Center City Circulation Program Estimates of Total Trips Generated 2/ During P.M. Peak Hours	
	Average Weekday 1/	P.M. Peak Hour		
Car drivers	59,800	10,000 }	11,900	
Car passengers	8,300	1,600 }		
MUNI	54,500	12,000 }	9,400	
BART	21,400	5,600 }	4,900	
AC Transit	8,500	2,500 }	2,800	
Golden Gate Buses	5,400	1,600 }	1,500	
Southern Pacific	4,500	1,200 }	1,400	
Greyhound, Charters				
Jitneys	3,900	1,000	700	
Walk	20,900	2,600	---	
Ferries	2,000	600	500	
SAMTRANS	1,200	400	500	
Total with transfers	190,400	39,100	---	
Total without transfers	183,000	37,000	33,600	

1/ Obtained by multiplying the estimated total project generated travel (see Table 7, page 69) by the following ratio:

$$\frac{\text{Total additional leasable square footage expected in the downtown area by 1982}}{\text{Total leasable square footage added by the 315 Howard project}} = 29.5$$

2/ Obtained by summing individual travel generation estimates for each additional building project projected to be occupied by 1982. Does not include the Pacific Gateway Project proposed for 201 Mission Street (EIR File number: EE 78.61)

Source: Memorandum to Selina Bendix, Office of Environmental Review from Chi-Hsin Shao, Center City Circulation Program, September, 4, 1979.

NOTE: Alan M. Voorhees and Associates' estimates of total person-trips generated during the p.m. peak hours were made prior to the Center City Circulation Program's estimates. Considering footnote 2, the two estimates are comparable.

estimated by Alan M. Voorhees & Associates and used in this EIR. The right-hand column indicates, for comparative purposes, the travel estimates prepared by the San Francisco Transportation Policy Group, Center City Circulation Program.¹ The travel data developed by the Center City Circulation Program are based on a total of about 9,208,000 square feet of net office space, whereas the data used in this study are based on a total of about 10,196,000 square feet. Given the difference in total square feet, the total person-trips projected by both studies is within 1%. Some differences exist for each individual mode.

4. Traffic Impacts

In estimating the impact of project-generated traffic on the streets adjacent to the project in relation to expected general traffic levels in 1982, the design year for the analysis, an expansion factor of 1.8% per year was applied to increase observed 1979 traffic volumes to expected 1982 base levels. This annual expansion rate is used by the City and County of San Francisco for planning purposes, and was also used in the EIR for the Proposed 101 California Street Project.²

Thus, in 1982 without the project, it is estimated that at the Howard and Beale intersection, the Howard Street eastbound and Beale Street (southbound one-way) approaches would continue to operate during the peak hour at about 10% and 25% of capacity, respectively, as they do now. The Howard Street westbound approach would operate in 1982 at about 83% of capacity compared to 80% currently during the peak hour.

¹Chi-Hsin Shao, Center City Circulation Program, memorandum to Selina Bendix, Environmental Review Officer, "A Proposed EIR Format for Transportation Impact Analysis," 4 September 1979.

²San Francisco Department of City Planning, Final Environmental Impact Report, 101 California Street Project, San Francisco, California, EE 78.27, 1979, p. 89.

The project would generate an estimated 2,030 daily vehicle trips, of which about 900 would be employee commute trips, and the remaining 1,130 would be non-commute trips (i.e., visitors to the project, employee trips other than to/from work, etc.). An estimated 340 vehicle trips would be generated by the project during the evening peak hour. This can be compared to the 7,150 vehicles currently leaving downtown San Francisco via the 5 freeway on-ramps in the downtown area south of Market Street during the evening peak hour.¹ Traffic using these ramps does not comprise all traffic leaving the downtown, nor would all the project traffic be expected to use the freeways. Any project traffic using these on-ramps during the peak hour would add to existing delays on the freeway system.

As no on-site or off-site parking would be provided by the project, the impact of project-generated vehicle trips would be largely dispersed throughout the area surrounding the project site. As existing parking in the area was observed to be approaching full occupancy, it would be necessary for some of these vehicles to park farther than 3 blocks away from the project.

It can be expected that project employees would find long-term parking spaces outside the immediate area of the project, but that noncommute trips would at least attempt to find short-term parking spaces close to the project building. During the evening peak hour, the 340 vehicle trips generated by the project would comprise about 225 employee commute trips and 115 non-commute trips.

¹CalTrans 1973 through 1976 traffic counts (most recent counts available) on the freeway on-ramps at Sterling Street, Harrison/Essex Streets, First Street, Mission/Beale Streets, Beale/Folsom Streets and Harrison/4th Streets. Based on peak-hour traffic counts on I-80 east of the 7th Street ramps and on the Bay Bridge in the eastbound direction it is estimated that the above ramp volumes have not increased by more than 5% over the 1973 to 1976 period. Because the highways operate at capacity during the peak hour, it is doubtful that peak-hour traffic has increased since that time, although the length of the peak period has increased; (telephone conversation, Kay Randall, CalTrans, February 1980).

The probable traffic impact of the project on the adjacent streets of Howard and Beale is estimated by assuming that all of the 115 noncommute trips would, in their search for a short-term parking space, drive by the project site. (Alternately expressed, this represents the assumption that one-third of all evening peak-hour trips generated by the project would pass through the adjacent intersection of Howard and Beale Streets.) It is estimated that with the project, Howard Street westbound at Beale Street would operate at about 84% of capacity, compared to about 83% without the project. The Beale Street approach (southbound) would operate at 29% of its capacity, compared to 25% without the proposed project, and the eastbound Howard Street approach would operate at 11% of its capacity, compared to 10% without the proposed project.

Table 9, page 72, shows that the cumulative number of vehicle trips estimated to be generated by downtown San Francisco office developments either under construction or proposed, would be about 59,800 daily trips and 10,000 trips during the evening peak hour. As some of these projects would be located north, as well as south of Market Street, the cumulative traffic impact would be dispersed over downtown streets. Existing delays would be increased by possibly as much as 10 minutes per trip and the peak traffic period would be extended in length throughout much of the downtown. It is estimated that the vehicular traffic generated by 315 Howard Street, 2,030 daily and 340 peak-hour trips, would contribute about 3-4% of the cumulative traffic impacts of these projects.

5. Loading, Deliveries

Assuming commercial vehicle generation rates of 4.2 daily trips per 10,000 square feet of office space, and 14.0 daily trips per 10,000 square feet of retail space, a total of 162 daily truck trip ends or 81 truck stops could be expected

during an average weekday. About 5% of these, or 4 vehicles daily, could be expected to be trucks, whereas the remainder would be delivery vehicles, vans, etc.¹ These volumes are small compared to the traffic volumes on adjacent streets. Traffic bottlenecks could be caused if commercial vehicles double-parked along Howard Street in front of the project site in the eastbound direction. Freight deliveries are expected to be made from Beale Street. Direct access would be provided to a freight elevator from Beale Street.

Off-street loading space would be on the southwest side of the project site adjacent to the core of the 315 Howard Building. Trucks would back into this from Beale Street. These truck movements would not be expected to block or impede traffic flow along Beale Street because of the low traffic volumes (10-25% of capacity).

The existing loading docks for Pacific Telephone would be maintained as long as Pacific Telephone will remain in the 215 Fremont building. Pacific Telephone vans would continue to enter the loading area from Howard Street and they would exit via Beale Street.

6. Parking Impacts

The project would generate an estimated parking demand of 450 long-term² spaces and 140 short-term³ spaces. As no parking spaces would be provided by the project, parkers would have to use both off-street and on-street parking spaces in the area of the project.

¹William Marconi, Senior Traffic Engineer, San Francisco Department of Public Works, "Commerical Vehicles in a Large Central Business District," no date, Figures 6-9. Available for public review at the Office of Environmental Review, 45 Hyde Street.

²Long-term parking demand calculated from: 898 daily employee commute trip ends \div 2 trip ends per roundtrip \div turnover rate (uses of each space per day) of 1.

³Short-term parking demand calculated from: 1,130 daily non-commute trip ends \div 2 trip ends per roundtrip \div turnover rate of 4.

As the parking supply is approaching full occupancy in this area, parkers would probably have to use facilities farther than 3 or 4 blocks away from the site. For example, the parking survey conducted for this study identified approximately 165 vacant off-street spaces and about 55 vacant on-street spaces in the 12-block area surrounding the project (see Figure 14, page 34, showing boundaries and Section II.C.3, Parking Conditions, page 35). These would, thus, not be sufficient to accommodate the estimated total parking demand of the project of 590 spaces.

The EIR for 101 California Street¹ identified about 570 vacant long-term spaces in the area defined by Market Street, the waterfront, Second and Folsom Streets. Competition for these, and indeed for any downtown parking spaces, will continue to be intense in future years. 315 Howard Street would be only one of 21 major office developments under construction or proposed in the downtown San Francisco area. If the other 20 developments exhibited similar parking demand characteristics to those assumed for this project, the potential cumulative parking demand of all 21 developments could be as high as about 17,400 spaces. Because some of the office projects would add some parking, the actual parking shortage increase would be less. The 315 Howard Street project would represent about 3-4% of this total.

On-Site Parking. There are currently 22 parking spaces provided on the 315 Howard site. Thirteen of these are leased on a monthly basis by Continental Development Corporation, and the remaining spaces are for the exclusive use of Pacific Telephone. They are primarily used to park the Pacific Telephone vans (often in tandem, i.e., 2 vehicles parked one behind the other), or to load and unload the vans. The spaces used by Pacific Telephone would remain. The 13 spaces leased on a monthly basis would be eliminated and would not be replaced.

¹San Francisco Department of City Planning, Final Environmental Impact Report, 101 California Street Project, San Francisco, California, EE 78.27, 1979

Access to the basement parking from the 315 Howard site would be eliminated and would be relocated to the southern side of the 215 Fremont Building, where there are currently about 16 spaces. These spaces would be relocated within the southern parking area to provide the new access. Shifting the access to the southern lot would improve traffic conditions along Howard Street in front of the 315 Howard site. Vehicles would enter or leave the basement parking via Beale or Fremont Street, both one-way streets.

6. Impacts on Transit

a. MUNI

In 1982 the MUNI lines that would serve the 315 Howard Site (within a 1,500-foot radius) would be expected to provide a total p.m. peak-hour capacity for 32,200 passengers, compared to a 1979 estimated capacity for about 26,000 passengers. This capacity calculation is based on the recommended maximum passenger loads. (See Appendix A-3, page 170, for descriptions of future MUNI service and for the capacity calculations.) The above capacity increase would be due primarily to the introduction of the MUNI Metro light-rail vehicles, which have 50% higher capacities than present streetcars. It is estimated that without the proposed 315 Howard project, or any other of the major projects under consideration, p.m. peak-hour ridership on these lines would be about 19,600 passengers by 1982. This would represent a volume/capacity ratio of 0.61. In other words, an average 61% of the recommended maximum passenger load on all vehicles serving the site would be occupied, leaving a peak-hour capacity reserve of 39%. Assuming that the MUNI 5-Year Plan deploys the transit supply in accordance with the actual transit demand, this average peak-hour condition would be the same on all MUNI lines.

One of the specific changes proposed in the MUNI 5-Year Plan is the routing of the 1-California trolley coach line to Beale (southbound from Market to Howard), Howard and Main Streets.

The terminal point for the 1-California line would be on Howard Street near Beale, where the 41-Union trolley line has its current terminal point. The 1-California trolleys would make a left turn from Beale Street onto Howard Street eastbound. The proposed project would increase traffic on the Beale Street approach from 25% to 29% of its capacity. The reserve capacity would be 71%.

The proposed 315 Howard Project would add about 400 additional riders on the MUNI lines serving the project site during the afternoon peak-hour. The new total ridership of 20,000 would correspond to a volume/capacity ratio of 0.62, an increase of about 2%. This increase would leave a reserve capacity of 38%. To estimate the cumulative impacts of all 21 office developments under consideration, all MUNI lines serving the downtown have to be considered in terms of their riderships and capacities expected in 1982. Without the cumulative impacts, p.m. peak-hour ridership in 1982 is estimated to be 33,000 passengers and capacity is estimated to be for 48,700 passengers, representing a volume/capacity ratio of 0.68. (See Appendix A-3, page 170, for details and assumptions.)

The 21 new office projects would generate an additional 12,000 passengers on the MUNI lines during the afternoon peak-hour (from Table 9, page 72) -- an increase of 36%. The new total load of 45,000 passengers would correspond to a volume/capacity ratio of 0.92, leaving an average 8% reserve capacity. Because this represents an average condition for a full hour, it can be concluded that with the 21 new office projects there would be a certain proportion of transit vehicles that would be overloaded and would be operating under "crush" conditions. In some instances MUNI patrons would not be able to get onto the desired vehicles and would have to wait for the next ones. Operating speeds and operating efficiency would decrease as a result of the overloading conditions. It is not possible to quantify these occurrences because it is unknown how closely the transit supply pattern follows the demand pattern nor to what degree overcrowding of buses affects bus delays.

If the MUNI 5-Year Plan is implemented according to its proposed schedule, the total p.m. capacity provided in 1984 would be for about 53,200 passengers.¹ If no other growth beyond the 21 office developments would occur between 1982 and 1984, this increased capacity would bring the average volume/capacity ratio down to about 0.85 during afternoon peak-hour.

The cumulative impacts on MUNI service are dependent on the implementation of the 5-Year Plan. If the expected efficiency and capacity increases could not be achieved as scheduled or within budget constraints, the cumulative impacts on MUNI could worsen rapidly beyond the load levels indicated above, and the load conditions could become intolerable. Secondary effects such as shifts to other travel modes (auto, pooling, BART, bicycling) or to other travel times or relocation of employers or retail facilities could be expected.

b. BART²

In 1980, BART trains are operating at an estimated load factor of 1.1 to 1.2 during the afternoon peak hour. Assuming 7-minute headways between trains, 9-car trains, and 72 seats per car, average peak-hour ridership in the peak direction (eastbound in the afternoon) would be about 6,400 passengers.³ Based on a 1.5 load factor (50% standees), the capacity during the p.m. peak-hour can be estimated at 8,300 passengers. By 1982 it is estimated that ridership would have increased by 10% as a result of regular patronage increases and by about 700 passengers as a result of the expected start-up of the Richmond-Daly City line. Afternoon peak-hour ridership in the eastbound direction would thus be about 7,700 by 1982. BART hopes that within 1

¹San Francisco MUNI, 5-Year Plan (Draft), 22 February 1979, page 155.

²Based on conversation with John Stanis, Planner, BART, 11 February 1980.

³60/7 trains per hour x 9 cars per train x 72 seats per car x 1.15 passengers per seat.

or 2 years it would be able to operate the trains at 5-minute headways. Peak-hour capacity could thus be estimated at 11,700 in one direction by 1982, leaving a reserve capacity for 4,000 passengers assuming a load factor of 1.5.

The proposed 315 Howard Project would add 190 person-trips on the BART system during the afternoon peak hour. About 100 of these trips would be destined to the East Bay and 90 trips would be destined to the west. The 100-passenger increase would represent an increase of about 1.3% in that direction, and would leave a reserve capacity for 3,900 passengers.

Under the cumulative impacts of all 21 office developments, about 5,600 additional riders would be added onto BART trains during the afternoon peak hour, about 3,000 in the east-bound direction and 2,600 in the westbound direction. This increase would absorb 75% of the reserve capacity available in 1982. Trains would operate with an average load factor of 1.37 during the afternoon peak hour. Because of uneven passenger and train arrivals during the peak hour, some of the 12 hourly trains would operate at load factors above the accepted maximum, which would result in crush conditions on certain trains, and in patrons not getting onto the train and have to wait for the next train.

c. AC Transit¹

AC Transit is currently operating about 182 buses out of the TransBay Terminal to the East Bay during the afternoon peak hour. By 1995 this number of buses is expected to increase to 246.² Assuming a straight-line increase, there would be 194 buses leaving the terminal between 4:30 p.m. and 5:30 p.m. in 1982. Based on a policy load factor of 1.00 (1 seat per passenger) and on an average of 50 seats per vehicle (including

¹Based on conversation with Gene Gardener and Ted Reynolds, AC Transit Planning and Research, 3 May 1979.

²U.S. Department of Transportation, Draft Environmental Impact Statement, San Francisco Bay Area Transportation Terminal Expansion, January 1979.

articulated or 2-coach jointed buses), a total capacity (seat capacity) of 9,700 passengers would be provided in 1982. It is expected that in 1982 AC Transit would carry about 13,000 passengers in the peak afternoon period (4 p.m. - 6 p.m.) without any major developments in Downtown San Francisco.¹ Assuming that 60% of this demand, or 7,800 trips, would occur during the peak hour (4:30 to 5:30 p.m.), a load factor of 0.80 can be expected in 1982. An average reserve capacity for an additional 1,900 transbay passengers would exist. This would not include any standees.

The proposed 315 Howard project would generate an additional 84 passenger trips on AC Transit during the afternoon peak hour. This would represent about 4% of the reserve capacity.

With all 21 major office developments, an additional 2,500 passengers would be generated on the AC Transit transbay lines during the afternoon peak hour. This would represent 600 passengers more than the available reserve capacity. There would be at least 600 standees, corresponding to a load factor of 1.06, 6% above policy load factors of AC Transit. This would mean that a certain number of vehicles would run at crush loads and that occasionally patrons could not get on the desired buses. To maintain the load factor at the policy level of 1.0, an additional 12 buses would have to be put into transbay service during the afternoon peak hour. Based on an annual operating cost of \$60,000 (1979 dollars) per bus, this would require an additional \$720,000 per year. The share of the 315 Howard project would be about \$24,000 per year (3.4%).

d. Golden Gate Transit²

Golden Gate Transit is currently operating 147 buses out of the downtown area during the afternoon peak hour, about 120

¹Based on an annual ridership growth of 3%.

²Based on conversation with Peter Dyson and Alan Zadradnik, Golden Gate Transit, 3 and 4 May 1979.

buses on the financial district routes and 27 buses on the Civic Center routes. On the average, these buses run at their design capacity level as set by Golden Gate policy, i.e. at seating capacity. Golden Gate Transit allows a maximum (crush) capacity of 55 passengers per bus, corresponding to 10 standees -- the maximum number of standees allowed by union contract. Current peak-hour ridership out of downtown is estimated at 6,620 passengers. This ridership is expected to increase by about 5% per year, to about 7,660 passengers in 1982. Because of funding uncertainties, no bus fleet increase is planned for the near future. The only capacity increase that could be expected is due to the operation of articulated buses into San Francisco. These buses are currently operating on local Marin County routes. They could potentially be shifted over to transbay service. This could add an additional capacity of 240 seats into and out of downtown during the peak hour. With this additional capacity, the average peak-hour load factor would be 1.12, 12% above design capacity and 10% below the "crush" capacity. A certain number of vehicles would operate at "crush" capacity and some riders would not be able to get onto the desired vehicle.

Shifting the articulated buses from Marin County service to transbay service would not adversely affect Marin County services because the loads on intracounty service are generally less than the average bus capacity.

The proposed 315 Howard project would add about 53 riders onto the Golden Gate buses in the afternoon peak hour. This would represent an increase of about 0.7% of projected peak-hour ridership, which would tend to worsen the overall load conditions.

The 21 office developments under consideration would add a total of about 1,600 additional riders onto Golden Gate buses during the afternoon peak hour. Because the Golden Gate buses are expected to operate above their design capacity by 1982, this additional demand would have to be satisfied by a bus fleet increase or through alternative travel modes. To

carry the additional ridership, an additional 29 buses would be needed. This service expansion would increase the operating deficit of Golden Gate Transit by \$725,000 per year, based on an annual operating subsidy of \$25,000 per bus. The share of the 315 Howard project would represent an additional subsidy of \$24,700.

The Golden Gate ferries currently carry about 930 passengers out of San Francisco during the afternoon peak hour (4:30 p.m.-5:30 p.m.). This represents 2 ferry runs with a total capacity of 1,450 passengers. By 1982 the peak-hour ridership is estimated to be 1,080 passengers, leaving a reserve capacity of 370 passengers on these 2 runs.

The 315 Howard project is expected to generate about 21 additional passengers on all ferries. Based on the travel survey of the Crocker Bank employees,¹ about 70% or 15 of these passengers could be expected on the Golden Gate ferries a 1.4% increase.

The 21 office development combined would generate an additional 420 passengers on the Golden Gate ferries during the afternoon peak hour (600 additional passengers on all ferries). This represents 50 more passengers than the reserve capacity. Some ferry riders (at least 50) would have to shift to a later ferry run. The 6:15 p.m. run currently has a reserve capacity of about 400 passengers; the following run leaves at 7:15 p.m.

e. SamTrans and Southern Pacific Railroad²

There are currently 12 SamTrans buses leaving the downtown area during the afternoon peak hour. They operate at about 80% to 90% of seating capacity, corresponding to a peak-hour ridership of about 510 passengers. Assuming a maximum load factor of 1.25, it is estimated that there is a reserve capacity

¹San Francisco Department of City Planning, Final Environmental Impact Report, Proposed Crocker National Bank, EE 78.298, 1979, p. 232. This is the only employee survey available that breaks down ferry travelers by Golden Gate ferry and Tiburon ferry.

²Based on conversation with Mr. Larry Streck, Senior Transportation Planner, SamTrans.

for 240 passengers. Based on the most recent ridership increase, it can be projected that this reserve capacity will be used up by 1982.

By 1982, SamTrans plans to add about 20 runs out of San Francisco during the afternoon peak hour. This service increase would provide additional seating capacity for about 1,000 passengers.

The 315 Howard Project would generate an additional 12 passengers on SamTrans buses, representing about 1.2% of the projected capacity increase.

All 21 office projects combined would generate an additional 400 passengers on the SamTrans buses by 1982, representing about 40% of the planned capacity increase. A capacity reserve for 600 passengers would remain.

No definite plans are known regarding the future operation of the Southern Pacific Railroad's commute service. The transit districts or transit agencies of the three counties served by Southern Pacific currently subsidize 30% of the commute tickets. For an average commuter¹ this subsidy amounts to \$162 per year.

The proposed 315 Howard project can be expected to generate an additional 76 daily Southern Pacific commuters.² Based on the current subsidy, this would represent an additional \$12,300 per year of public subsidy to these commuters.

All 21 office projects combined would generate an additional 2,240 daily Southern Pacific commuters (76 x 29.5). This would represent a public subsidy increase of about \$363,000 per year.

f. Summary of Transit Impacts

Table 10, page 86 summarizes the additional subsidies needed to satisfy the cumulative and project demand for transit services.

¹It is assumed that an "average passenger" is one whose inbound trips originate in Zone 3, between Redwood City and Hillsdale.

²From Table 7; page 70: the average weekday trips divided by 2.

Based on their service projections, MUNI, BART and SamTrans plan to have capacity increases that could absorb the increased transit demand. These capacity increases are based on the anticipated revenues projected by the transit districts. It cannot be predicted with certainty that their plans will be implemented as scheduled.

Table 10: Additional Annual Subsidies Needed for Transit

<u>Transit System</u>	<u>Cumulative Impacts</u>	<u>315 Howard Share</u>
MUNI	-	-
BART	-	-
AC Transit	\$ 720,000	\$24,500
Golden Gate buses	725,000	24,700
SamTrans	-	-
SPRR	<u>363,000</u>	<u>12,300</u>
Total	\$1,808,000	\$61,500

7. Pedestrian Impacts

The project would generate about 6,200 total daily trips, all of which would involve walking for at least some part of the trip; for example travel to or from parked cars, to transit routes, visits to other offices or trips to other downtown facilities. Of these daily trips an estimated 1,250 trips would be added to the sidewalks and crosswalks in the immediate area of the project during the peak hour.

The project entrance would be at ground level near the center of the building, (see Figure 5, page 16). The principal directions of pedestrian movement would be west on Howard Street to the TransBay Terminal area (SamTrans, Golden Gate Transit, and AC Transit service, MUNI service on Mission Street), and north on Beale Street to the Embarcadero BART station and MUNI service on Mission and

Market Streets. The estimated impact of project-generated trips to adjacent sidewalks and crosswalks¹ in the peak hour is shown on Figure 24, page 88.

It is estimated that about 40% of people leaving the project during the peak hour would use Howard Street westbound, about 30% would use Beale Street northbound (and thus use the Howard Street crosswalk at Beale Street), and 15% each would use Beale Street southbound and Howard Street east of Beale (see Figure 24, page 88).

Both the Howard Street and Beale Street sidewalks would continue to operate at level of service A² under both average and peak conditions³ during the evening peak hour. Levels of service on the crosswalks adjacent to the project would in general be worsened by the project. During short peak conditions, the level of service on the Beale Street crosswalk would drop from A to A/B with the project. Under average conditions the level of service would remain A. At the Howard Street crosswalk, level of service conditions would be worsened from A to B for average flow conditions, and from A/B to D/E during peak flow conditions.

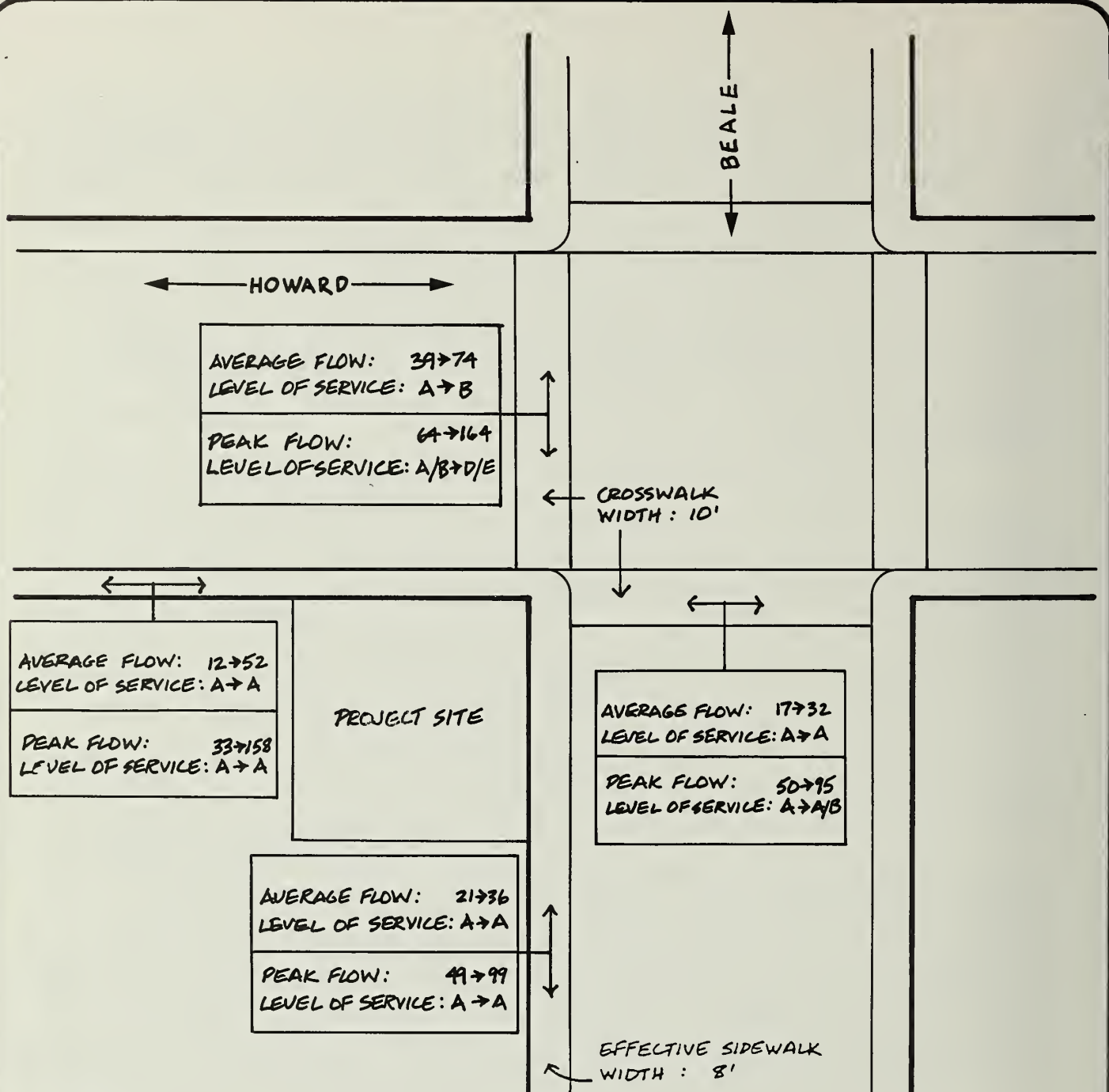
The pedestrian levels of service for the sidewalks are based on the pedestrian volumes and on the effective width of sidewalk, i.e., the full width of the sidewalk minus the width of obstacles such as lamp and signal posts, fire hydrants, garbage cans, etc. The levels of service for the crosswalks take into account the proportion of green time legally available to pedestrians.

It should be noted that the crosswalk levels of service estimated assume pedestrians would cross the street only during

¹Distribution of pedestrian trips based on projections of travel mode for peak-hour trips summarized in Table 7, and assuming that due to existing high parking occupancy levels in area 90% of project-generated vehicle trips park south of Mission Street.

²Levels of service are described in Appendix A-5, page 182.

³Peak five-minute pedestrian flow generated by project assumed to be 25% of hourly pedestrian flow generated.



NOTE:

- 1.) All flows are Pedestrians per 5-minute period.
- 2.) Without Project figures shown first, followed with Project figures.
- 3.) Level of Service descriptions are given in Appendix A-5, page 180.

PEDESTRIAN FLOWS (4:30-5:30 P.M.)

P.M. PEAK HOUR - WITH PROJECT

NOT TO SCALE



←→ Indicates pedestrian movement

Figure No. 24

the green WALK signal. In practice, pedestrians would also cross during the red flashing DON'T WALK signal, thus effectively increasing the capacity of the crosswalk. For the Howard Street crosswalk, for example, such pedestrian behavior could result in an actual level of service during peak conditions closer to B or B/C than the D/E estimated above. It should also be noted, however, that pedestrians still using the crosswalk at the end of the red flashing DON'T WALK signal constitute an obstruction to the vehicular traffic receiving a green signal through the intersection.

Beyond the 4 locations analyzed in Figure 24, page 88, the pedestrian flows generated by the proposed project decrease rapidly, as they will be distributed among 3 directions each time they reach a new corner. If the pedestrian flows would split up equally among the 3 possible directions, the peak 5-minute flow continuing north from the Howard Street crosswalk would decrease from 100 pedestrians to 17 pedestrians on the northbound crosswalk of Mission Street. This would represent between 3 and 4 pedestrians per minute.

8. Construction Impacts

During construction a peak employment load of 300 persons could be expected.¹ Assuming the same modal split for the construction employees as for the office employees, and an average parking turnover rate of 1.5 vehicles per space, a maximum of about 50 spaces would be needed to satisfy the parking demand of the construction workers. Construction would normally occur between the hours of 7 a.m. to 4:30 p.m.

Because no specific construction plans have yet been developed, construction impacts cannot be clearly determined. Truck and other construction equipment would enter the site from either Howard Street or Beale Street. Truck movements entering or leaving the project site from Howard Street could

¹Letter from Continental Development Corporation to Ted Adams, EIP Corporation, 22 March 1979.

impede traffic flows along this road, especially in the eastbound direction. Along Beale Street these disruptions would be less because the volumes are lower and because there are 4 lanes in one direction.

It is expected that construction would encroach on existing sidewalks and would make pedestrian circulation more dense by narrowing the sidewalk.

D. NOISE

The potential noise impacts that would be associated with the proposed project fall into 3 areas: the impact of the existing noise environment on the proposed use of the project site; the impact on adjacent uses of noise generated by the use of the site as proposed; and the impact of construction noise on adjacent and nearby uses.

1. Compatibility with Existing Noise Environment

The City and County of San Francisco has adopted guidelines¹ for determining the compatibility of various land uses with different noise environments. For proposed office space, the guidelines state that in an exterior noise environment of 70-75 L_{dn} , construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the building's design. It is proposed at this time to use 1/4-inch plate glass in the windows of the building. The windows, which would not be operable, would reduce traffic noise by about 25 dBA. This would result in instantaneous maximum noise levels of up to 56 dBA inside the building each time a loud truck or bus passed the site. Noise levels on the 24th floor would be several dBA less. The average level inside the building would be 45 L_{eq} during the day.

¹Environmental Protection Element of the San Francisco Comprehensive Plan, adopted by City Planning Commission, Resolution No. 7244, 19 September 1974.

A L_{eq} of 45 dBA would be considered the upper limit of acceptability for noise in a private/semiprivate office or small conference room where good listening conditions are desired by occupants. The projected peaks of up to 56 dBA could interrupt a speaker talking in a normal tone of voice in a small conference room. Although these peaks would not interfere with phone conversations, they would be sufficiently high to cause some distraction.

2. Noise Impacts of the Proposed Site Use

Postconstruction operation of the proposed 315 Howard Street Building could increase noise levels in 2 ways: (1) by generating additional traffic in the vicinity, hence causing an increase in overall traffic noise levels, and (2) by adding to the noise environment the sounds of mechanical equipment associated with the building.

The amount of traffic generated by the building during any hour of the day would cause noise levels to increase by less than 1 dBA on any of the adjacent streets or the freeway. A 1 dBA increase in environmental noise is undetectable by the human ear. The mechanical equipment to be used at the building has not yet been selected. San Francisco's Noise Ordinance sets limits on the amount of noise this equipment can emit.¹ The Noise Ordinance requires that noise from the mechanical equipment at the proposed building not exceed 60 dBA at the property line of the property affected by noise emissions. This level is at or below the existing background noise level in the vicinity of the site and no increase in noise levels due to mechanical equipment would be expected.

¹City Ordinance No. 274-72, Regulation of Noise, adopted 10 August 1973.

3. Construction Noise Impacts

Construction noise in San Francisco is also regulated by the Noise Ordinance. The Noise Ordinance requires that all powered construction equipment (except impact tools and equipment) not emit more than 80 dBA when measured at a distance of 100 feet. Impact tools and equipment, including pavement breakers, jackhammers, and piledrivers, must have both their intake and exhaust muffled to the satisfaction of the Director of Public Works. The ordinance further requires a special permit for construction after 8 p.m. and before 7 a.m.

Construction of the 315 Howard Street Building would take place in the following 3 phases: excavation, foundation construction and building erection. Construction noise levels would fluctuate measurably depending on the following variables: the phase of construction, the duration, the type(s) of equipment used during that phase, the noise emitted during its 'noisy' mode of any particular item(s) of equipment in use, the proportion of the day during which the equipment would be operated in its noisy mode, the mobility of the equipment (e.g., the noise source might be a stationary air compressor or a self-propelled backhoe) the distance between the noise source and the receptor, and the noise propagation characteristics of the path between the noise source and the receptor (e.g., shielding by a barrier or intervening building would result in a reduced noise level at the receptor). The worst-case noise impacts associated with the various phases of construction have been estimated.

During excavation, bulldozers, graders, haul trucks and front-end loaders would be expected on the project site. these pieces of equipment generate from 70 to 85 dBA at 50 feet (64 to 79 dBA at 100 feet). During foundation construction the most significant noise source would be pile-driving. During pile-driving, noise levels of approximately 105 dBA at 50 feet can be expected during a period of up to 1 month. After the pile-driving phase, concrete pumpers, power saws, cranes, air

compressors, engine generators, and impact torque wrenches would be the major noise sources. These pieces of equipment emit from 70 to 95 dBA at 50 feet. The impact wrenches emit the highest noise levels of 95 dBA at 50 feet and would typically be in use for 1 to 2 months.

The occupied land use nearest to the construction site is the office building at 215 Fremont Street, which flanks the construction site on the south and west. The land uses opposite the construction site consist of parking lots, a warehouse, and the 3-story Marine Electric Building (see Section II.B, Land Use, page 26). Because the building at 215 Fremont shares the property line with the proposed construction site, noise-generating activities would occur within 5 or 10 feet of the outside of the building. At this distance, rooms facing the site would be affected and noise levels outside of the nearest offices could reach 120 dBA during pile-driving. With the windows in the building closed, noise levels of 95 to 100 dBA would result inside the 215 Fremont building. Office workers would not be able to carry on a conversation, would not be able to use the telephone, would be distracted from their work, and probably complain to the management about the noise. In addition to the noise levels generated by this activity, vibration levels would be great enough to shake the building. The pile-driving noise level at other noise-sensitive buildings in the area, including Golden Gate College, would be at or below levels generated by existing traffic.

During the use of the impact wrenches directly outside the 215 Fremont building, noise levels could reach 85 to 90 dBA inside. This activity would be sporadic. Workers in those offices nearest the noise source would not be able to use the telephone or carry on a conversation when the impact wrenches were in use.

As construction moves to other portions of the site, above and away from the 215 Fremont Building, noise levels would go down.

Pile-driving taking place at the farthest point from the 215 Fremont Building (approximately 150 feet away) would cause maximum noise levels inside the building of 70 to 75 dBA. At this level, the noise, from the pile-drivers would be expected to interfere with conversation and the telephone and would be distracting to the employees.

During other construction phases, noise levels inside the 215 Fremont Building would range from the existing noise level (during lulls in construction) to maximums of up to 70 dBA. (See discussion of noise mitigation, Section IV.C, page 125.)

E. CLIMATE AND AIR QUALITY

1. Climate

The existing low wind speeds under northwesterly wind conditions would remain unchanged by the proposed project. For westerly winds, speeds would increase at the Howard/Beale intersection, with existing low to moderately low speeds becoming moderately low to moderately high.

Shadows from the proposed building would affect the sidewalk areas adjacent to the project site in all seasons, and the entire Howard/Beale intersection in fall, winter and spring (see Appendix C, page 195).

The combination of shadows and higher winds would increase pedestrian discomfort near the site. The Howard and Beale intersection would have the greatest increase in discomfort frequency, lesser increases would occur along Howard Street and Beale Street. The Fremont/Howard Street intersection would be unaffected.

Open areas of the ground floor would experience uncomfortable winds with periods of turbulent wind carrying dust, exhaust and litter adding to pedestrian discomfort.

2. Air Quality

Construction activities would generate pollutants in the vicinity of the project. Trucks and equipment would all release exhausts that would affect neighboring buildings during construction hours. Earthmoving, grading and site excavation would generate dust and suspended particulates.

Direct atmospheric emissions from the project would be from combustion of natural gas for water and space heating. Natural gas is a relatively clean-burning fuel; therefore, no visible fumes would occur. Exhaust gases would be emitted at rooftop and would be diluted to concentrations below the ambient air quality standards before reaching ground level. Odors could occur within portions of the building if there were a pipe leak or equipment malfunction.

The project would act as an indirect source of atmospheric emissions, i.e., attract auto traffic. On the local scale, carbon monoxide (CO) is a pollutant emitted by autos. An analysis of 1980 CO levels 1 block from the site found that under worst-case traffic and meteorological conditions, CO concentrations would be less than 50% of the ambient air quality standards.¹

A 1978 study for the Yerba Buena Center² showed that the traffic generated by that project would result in an increased frequency of violations of the 8-hour carbon monoxide standard in the vicinity of the Center. The Yerba Buena Center is about six blocks west of the 315 Howard Street building. Implementation of the Yerba Buena project would probably increase background carbon monoxide levels near the project site.

The air quality impact analysis of the Yerba Buena Center shows that cumulative large-scale development could result in violation of the CO standards. Thus, continued development north and south of Market near the site beyond the year 1980

¹Bay Area Air Quality Management District, Guidelines for the Air Quality Impact Analysis of Projects, June 1975.

²San Francisco City Planning Commission and Redevelopment Agency, Final Environmental Impact Report, Yerba Buena Center, EE 78.207, Certified 25 April 1978.

could increase traffic levels and congestion to the point where the standards would be exceeded. As indicated in Section III.C, page 67, Transportation Impacts, the project would contribute about 3% to 4% of the cumulative impact of 21 developments either under construction or proposed for downtown San Francisco.

Projected carbon monoxide concentrations for 1982, near the site, with and without the project were calculated using traffic volumes as presented in the traffic setting and impact sections. The results for worst-case meteorological conditions are summarized in Table 11. The greatest impact would occur along Howard Street. These concentrations represent the exposure a person would have at curbside. Carbon monoxide levels drop off rapidly with distance from curbside.

The regional impact of the project would be due to the increase in Vehicle Miles Traveled (VMT) associated with the project.

TABLE 11

Curbside Carbon Monoxide Concentrations
(parts per million)

	Without Project		With Project	
	1982		1982	
	<u>1-hr.</u>	<u>8-hr.</u>	<u>1-hr.</u>	<u>8-hr.</u>
Beale Street	2.1	0.3	2.1	0.3
Howard Street	<u>6.3</u>	<u>0.9</u>	<u>6.8</u>	<u>1.1</u>
Existing Federal Standards	35.0	9.0	35.0	9.0

Based upon the project transportation estimation of trip generation and destination (see Section III.C), the daily regional increase of VMT is estimated at 7,450. Using updated

composite emission factors supplied by Mike Kim of the Bay Area Air Quality Management District and assuming an average trip speed of 25 mph, total regional emissions from the project traffic have been estimated in Table 12.

TABLE 12
Regional Automobile Emissions (tons/day)

<u>Pollutant</u>	<u>1982 Project Emissions</u>	<u>1982 Regional Emissions¹</u>
Carbon Monoxide	0.24	1,500
Hydrocarbons	0.03	950
Nitrogen Oxide	0.02	800

The above increase in regional emissions would result in a degradation of regional air quality. Of particular importance are the increases in hydrocarbons and oxides of nitrogen which result in the formation of photochemical oxidants. A recent study of regional air quality² found that photochemical oxidant would be a persistent problem in the future, and that reductions in hydrocarbon and oxides of nitrogen emissions would be necessary to attain the federal standard for photochemical oxidant in the Bay Area. The project's emissions represent an increase of at most 0.02% in regional emissions. Recent photochemical oxidant modeling conducted for the proposed Yerba Buena Center³ found that the emissions from that project

¹Bay Area Air Pollution Control District, Air Pollution and the San Francisco Bay Area, June 1977.

²Association of Bay Area Governments, 1979 Bay Area Air Quality Plan, January 1979.

³San Francisco Department of City Planning and San Francisco Redevelopment Agency, Draft Environmental Impact Report, Yerba Buena Center, January 1978.

would result in no measurable change in Bay Area oxidant concentrations. The regional emissions for the proposed project would be on the order of 5-10% of those for the Yerba Buena project; therefore, no measurable effect on regional oxidant concentrations would be anticipated.

Since photochemical oxidant reactions are such that peak ozone concentrations occur several hours after hydrocarbons and nitrogen oxides are emitted, it is not expected that the project would have an effect in San Francisco itself.

F. GEOLOGY AND SEISMICITY

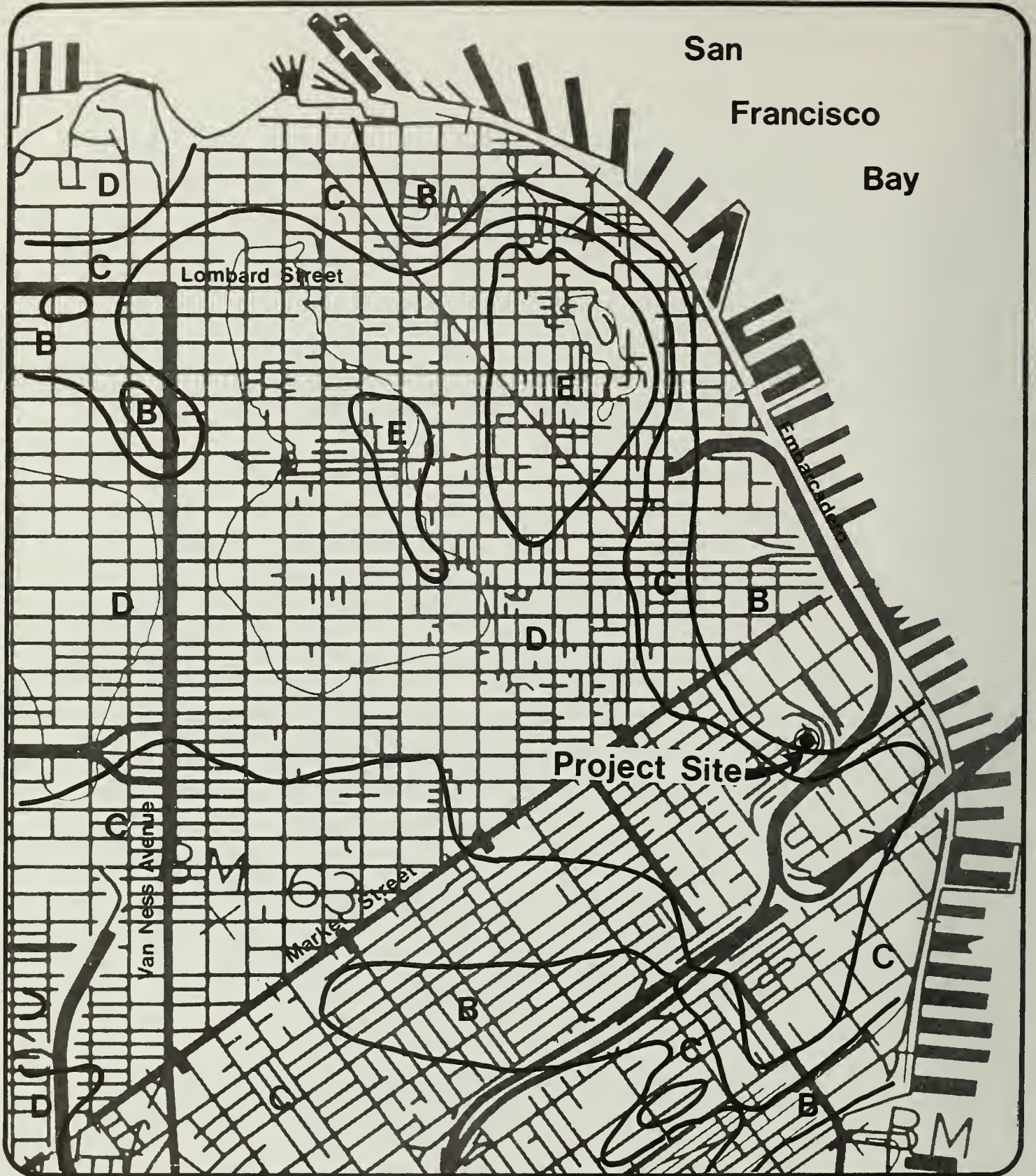
Construction on Bay muds requires special engineering considerations because of the inherent mechanical properties of the muds. The deposition of Bay muds over 10,000 years ago occurred so rapidly that the muds did not have time to consolidate, i.e., to have the water squeezed out by slow, natural processes. As a result, the muds are soft and saturated with water (the water table is about 10 feet below the ground surface). The Bay muds consist of fine-grained particles ranging from clay size to silt and very fine sand. Due to the fine texture of the grains and a jelly-like matrix (broken-down material between the individual grains), the muds are highly impermeable. It is due to this saturation that the muds have a low strength and are incapable of supporting heavy loads. When a load, such as a building, is placed on the muds, the water is squeezed out at a rate faster than under natural conditions, and a reduction in volume results. The topographical expression of the reduction in volume is settlement. The amount of settlement to be expected depends on the compressibility of the mud, the depth of the mud, the amount of fill imposed on it and the weight of the load.

If any of these parameters vary over the area of the site, differential settlement would occur, i.e., some parts of the site would settle faster than others. It has been estimated¹ that a total settlement of two inches could occur on the project site should the proposed project be implemented (this includes a differential settlement of 3/4 inches). About 75% (or 1½ inches) of this settlement would take place during the construction of the project, while 25% (or ½ inch) would take place after construction was completed.

If an earthquake of a maximum estimated magnitude of 8.25 on the Richter scale were to occur along the San Andreas Fault, the project site will experience groundshaking. The City and County of San Francisco has been divided into different zones of estimated groundshaking intensity based on such factors as distance to fault and subsurface and surface geological conditions (see Figure 25, pages 100 and 101).² The zones range from A (very strong groundshaking) to E (weak groundshaking). The project site is located in a zone where groundshaking would be violent (Zone B), indicating fairly general collapse of brick and frame structures not constructed to be unusually strong; serious cracking of well-constructed buildings; lateral displacement of streets, bending of rails, and ground fissuring. The main reason for the "B" zoning of the project site is the fact that it is underlain by unconsolidated material such as fill, sand and mud, which are more susceptible to shaking than massive bedrock.

¹Harding-Lawson Associates, Consulting Engineers and Geologists, Preliminary Conclusions and Recommendations of Foundation Investigation for 301 Howard Street, Letter to EIP, 23 April 1979.

²URS/John A. Blume, San Francisco Seismic Safety Investigation, prepared for the Department of City Planning, City of San Francisco, June 1974.



Estimated Intensity of Future Ground Shaking (Refer to Legend, Figure 25b)

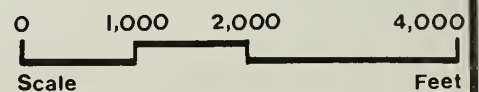


Figure No. 25a

Source: San Francisco Seismic Safety Investigation,
John A. Blume & Associates, June, 1974

- A** Very violent. Cracking and shearing of rock masses. Deep and extended fissuring in soil, many large landslides and rockfalls.
- B** Violent. Fairly general collapse of brick and frame structures when not unusually strong. Serious cracking of better buildings. Lateral displacement of streets, bending of rails and ground fissuring.
- C** Very strong. Masonry badly cracked with occasional collapse. Frame buildings lurched when on weak underpinning with occasional collapse.
- D** Strong. General but not universal fall of brick chimneys. Cracks in masonry and brick work.
- E** Weak. Occasional fall of brick chimneys and plaster.

NOTE: Intensities are given for earthquakes similar to the 1906 event in Magnitude and proximity to San Francisco.

Legend:

Estimated Intensity of Future Ground Shaking

Figure No. 25b

Based on design of the structural frame and pre-cast concrete piles (see Section IV.E., page 127), it is estimated that an earthquake of up to 6.9 magnitude on the Richter scale with the epicenter 10 to 12 miles from the project site would probably not result in any structural damage to the steel frame or foundations.¹ An earthquake ranging upward from 7.2 on the Richter scale with the epicenter 10 to 12 miles from the project site possibly could result in some permanent deformation of structural members. It is more likely that an earthquake of the magnitude that occurred in San Francisco in 1906 (8.25 on the Richter scale) would result in permanent deformation; building collapse would not be expected.¹

The liquefaction² potential of the underlying soils has not been determined at this time. Laboratory tests are currently being performed to determine the liquefaction potential of the project site.

G. ENERGY

1. Introduction

The electrical consumption estimates for the proposed project made below were based on comparable power demand and electrical energy consumption data obtained from PG&E for similar buildings and occupancies in the downtown San Francisco area. The comparative data was first analyzed to determine energy consumption in kwh per month per square foot.³ The consumption figures were then adjusted downward to take into consideration the following planned energy conservation design measures:⁴

¹Letter from Continental Development Corporation to Environmental Impact Planning Corporation, 30 April 1980.

²Liquefaction: earthquake-induced transformation of a stable granular material, such as sand, into a fluidlike state, similar to quicksand.

³1 kwh (kilowatt hour) = the consumption of 1,000 watts of electricity for the duration of one hour.

⁴The Engineering Enterprise, Consulting Electrical Engineers, "301 Howard Office Building Electrical Input for EIR Statement," Berkeley, California, March 1979; available for public review at the Office of Environmental Review, 45 Hyde Street, San Francisco 94102.

1. The building envelope and all the air conditioning, service hot water and lighting systems would be designed in accordance with California Administrative Code, Title 24, "Energy Conservation Standards for Non-Residential Buildings."
2. Economizer cycle features would be used for all building air conditioning systems to reduce the building cooling requirements.
3. Automatic light switching.

The natural gas estimates are based on actual operating data obtained from existing similar buildings having approximately the same size, operating characteristics, mechanical systems and design features as the proposed building. The existing building loads were modified for glass exposure, orientation and shading to arrive at the loads for the proposed building. These calculations assumed that the building would use gas for space and water heating, would be heated for 26 days per month, that the heating system efficiency would be 70%, that gas has a heating value of 1050 Btu¹ per cubic foot,² and that electric air conditioning would be used for building cooling.

2. Construction

One method of calculating the energy that would be consumed in constructing the proposed building would be to total the energy costs of all materials used and the cost of energy consumed by all equipment used during construction. A less precise but more practical procedure is to use a gross energy consumption/dollar

¹Btu = British thermal unit, the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at about 39° F.

²Donald Bentley and Associates, Report for 301 Howard Street Building, San Francisco, April 1979, p. 1; available for public review at the Office of Environmental Review, 45 Hyde Street.

cost ratio.¹ Based on a construction cost of approximately \$17 million (construction of the shell), it is estimated that 41 billion Btu of energy would be consumed during construction of the proposed project.² This is equivalent to 7,600 barrels of crude oil.

3. Operation

a. Electricity

Pacific Gas and Electric Company would supply electricity to the proposed project. The total connected kilowatt load for the project is estimated at 4,070 kilowatts.³ The project's estimated average monthly electrical consumption would be about 320,000 kilowatt hours (kwh), equivalent to 1.03 kwh per square foot of rentable floor area per month. This compares to estimated values contained in other environmental impact reports of 1.4, 1.8 and 2.5 kwh per square foot per month for highrise projects at 333 Market, 444 Market and 595 Market, respectively. Daily and annual load distribution curves for electrical energy consumption are given in Figure 26, page 105. Because tenant use of computers has not been determined, final electrical consumption cannot be precisely determined until the tenants are known after building construction.

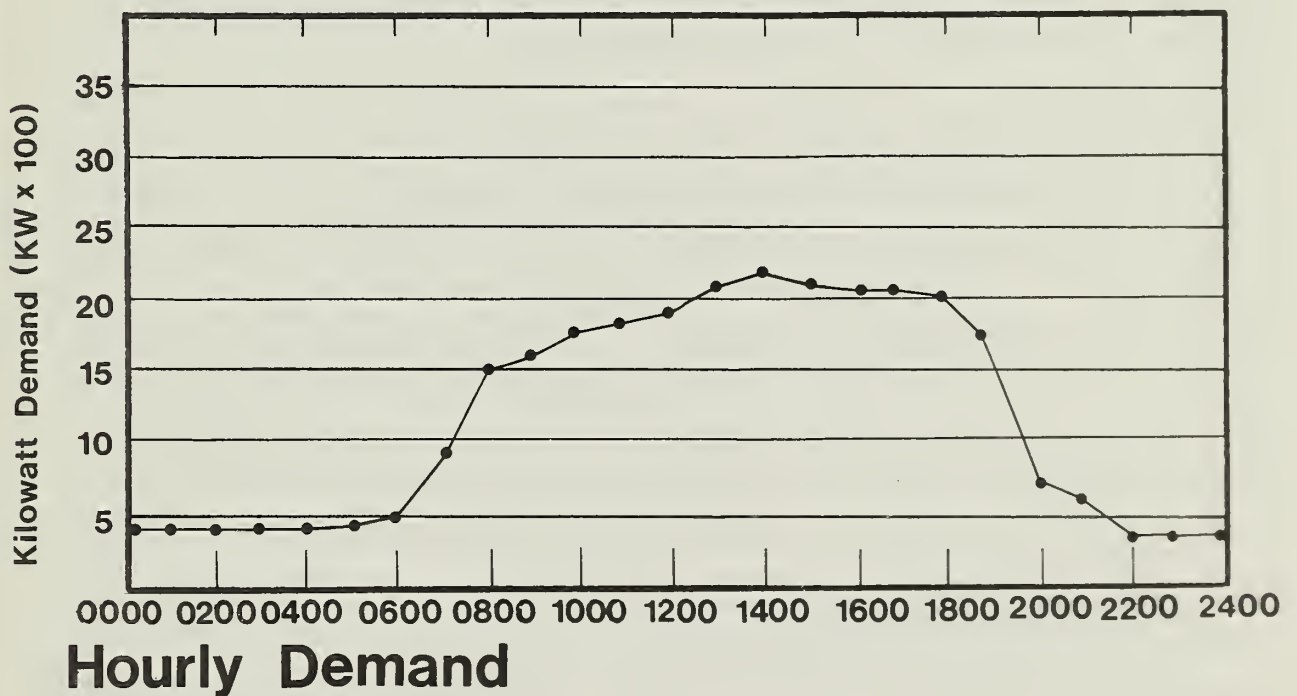
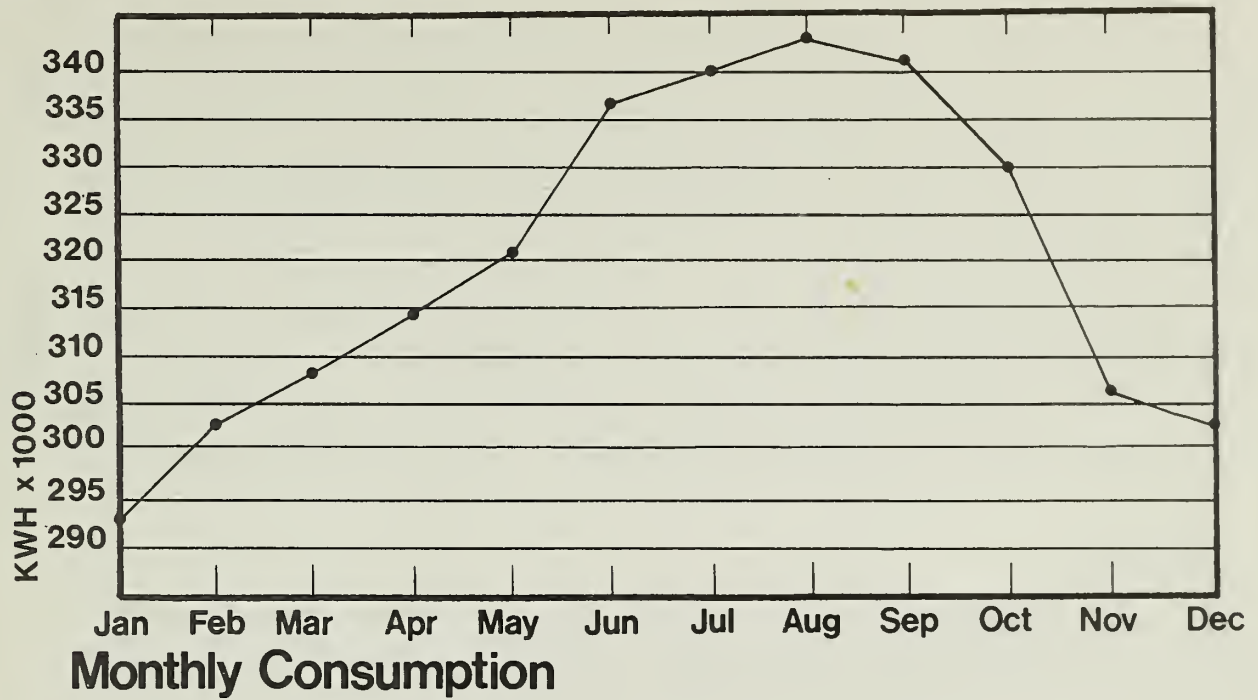
b. Natural Gas

The estimated average monthly natural gas consumption for the proposed project is 85 Btu per square foot of floor space

¹Tetra Technology, Inc., Energy Use in the Contract Construction Industry, Arlington, Virginia, 1975.

²Environmental Impact Planning Corporation, Energy Impact Handbook, San Francisco, 1976, Table C-10f.

³The Engineering Enterprise, Consulting Electrical Engineers, 301 Howard Office Building Electrical Input for EIR Statement, Berkeley, March 1979.



Estimated Electrical Consumption

SOURCE: The Engineering Enterprise,
Consulting Electrical Engineers,
Berkeley, Ca.

Figure No. 26

per day.¹ This compares with estimated figures from other EIRs of 137, 120 and 300 Btu per square foot per day for 333 Market, 444 Market and 595 Market, respectively. The magnitude of the estimated peak natural gas demand for the proposed project is about 3,600 cubic feet per hour.² Daily and annual load distribution curves for natural gas use are given in Figure 27, page 107. Because space heating requirements would vary with the tenant office furnishings and equipment, final gas consumption cannot be precisely determined until the tenants are known after building construction.

4. Removal

It is difficult to predict the energy consumption of demolition methods in the distant future. Present demolition methods are quite similar in their energy use characteristics to current construction methods; if these were the case at the time of removal of the proposed project, then the energy cost of removal would also be 41 billion BTU.

5. Lifetime Energy Costs

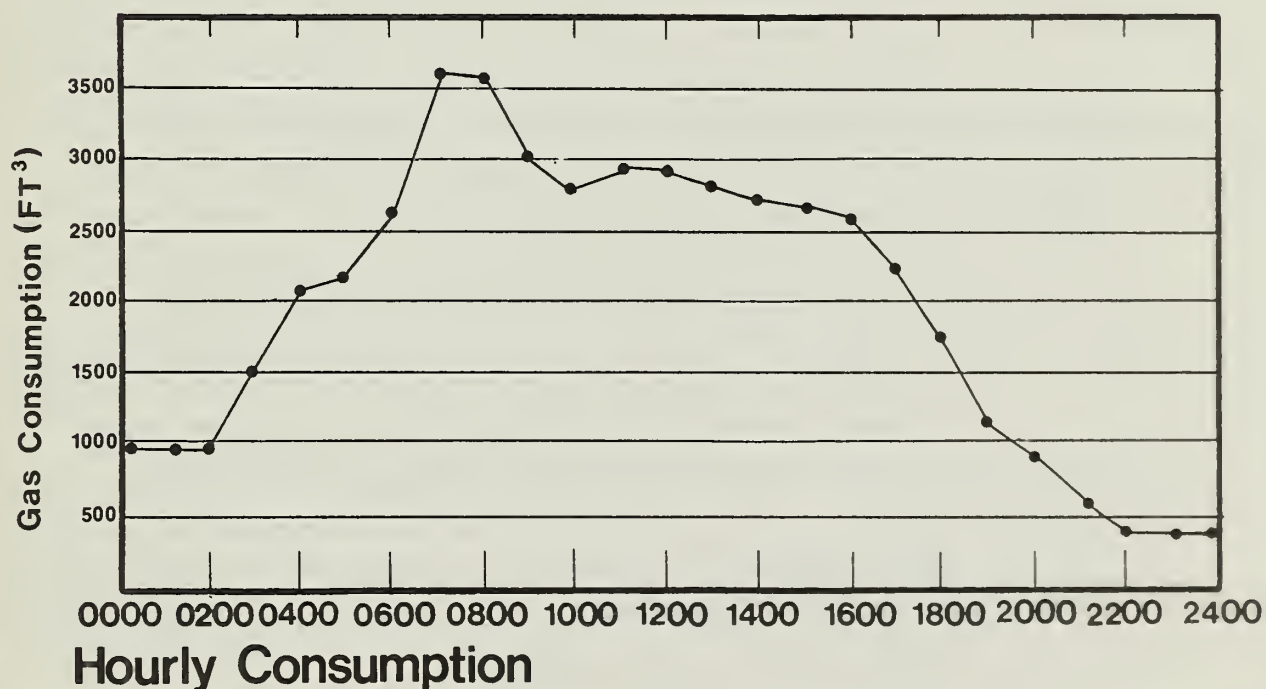
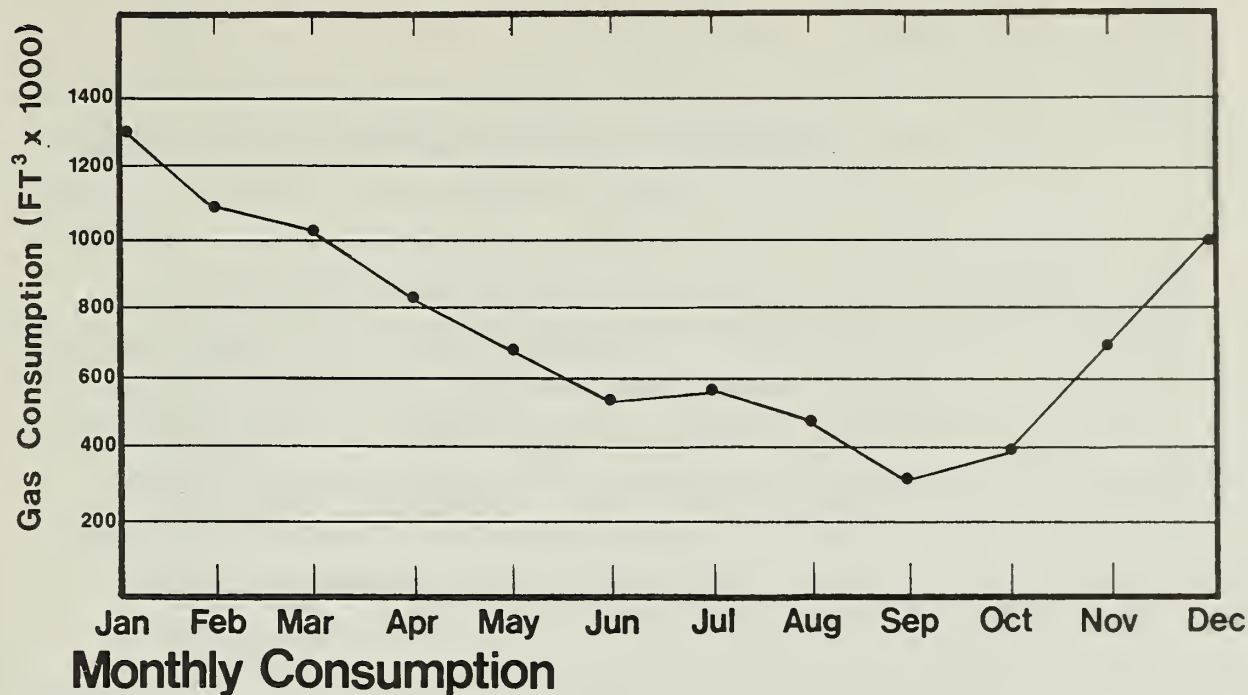
The estimated annual electrical demand for the proposed project is 3.8 million kwh, equivalent to 39 billion Btu (1 Kwh = 10,239 Btu).³ The estimated annual gas consumption is 9.1 million cubic feet, equivalent to 9.6 billion Btu.⁴ Assuming a 50-year lifetime for the building and an energy cost for construction and removal of 41 billion Btu each, or 82 billion Btu total, the estimated lifetime energy cost of the proposed project is 2.5 trillion Btu; this is equivalent to approximately 470,000 barrels of crude oil (1 barrel = 42 gallons).

¹Donald Bentley and Associates, Report for 301 Howard Street Building, San Francisco, April 1979, p. 1.

²Ibid.

³Ibid., p. 2.

⁴Ibid., p. 1.



Estimated Gas Consumption

SOURCE: Donald Bentley and Associates, Engineers,
San Francisco, Ca.

Figure No. 27

H. COMMUNITY SERVICES

1. Police

The security arrangements in the proposed building would consist of electric locks on interior stair doors, 24-hour illumination of public areas, TV surveillance of ground floor exits and high use public areas such as the main lobby and building entrances, and guard service at the main lobby during regular business hours, including late evenings and weekends. It is not anticipated that the proposed project would require additional demand for police services in terms of manpower or equipment. If traffic accidents increased proportionately to the additional traffic generated by the proposed project, 1 accident in the next 5 years may occur at the Beale and Howard intersection due to the increased volume of traffic associated with the proposed project (6% increase, see III.C Transportation, page 67).

2. Fire

An 8-inch underground fire service line would be provided from a separate connection to the street water mains.¹ Fire service lines are required for the combination standpipes and sprinkler system throughout the building.

Annual consumption of water on this service would be limited to sprinkler flow alarm testing unless there is a major fire in the building. Self-contained fire and life safety systems consisting of sprinklers, alarms and smoke removal systems would be provided as required by Section 1807 of the San Francisco Building Code.

Adequate water supplies exist and the water distribution system on Howard and Beale Streets would be adequate to supply the building's fire protection water needs.²

¹Donald Bentley and Associates, Report for 301 Howard Street Building, San Francisco, April 1979, p. .

²Gene Anderson, Superintendent, Bureau of Engineering and Water Supply, San Francisco Fire Department, telephone conversation, 13 February 1980.

The San Francisco Fire Department anticipates no unique highrise fire-fighting problems for the proposed project.¹ A fire protection plan would not be required of the project sponsor.²

3. Water

Water service for the proposed project is required for domestic uses and for cooling-tower operations. The estimated water requirements for the project are as follows:

- Peak demand: 350 gallons per minute (47 cubic feet)
- Peak daily consumption: 88,900 gallons per day (11,885 cubic feet)
- Annual consumption: 20,570,000 gallons per year (2,750,000 cubic feet)

Water consumption is calculated on the basis of 20 gallons per day per person for 22 days per month; peak demand is calculated on the basis of 0.1 gallons per minute per person. Cooling tower make-up water rate is based on 2 percent of the condenser water flow rate.³

Adequate water supplies currently exist and the water distribution system on Howard and Beale Streets would be adequate to supply the proposed project's water needs without affecting services to other customers on the system.⁴

According to the Downtown San Francisco Conservation and Development Planning Program Phase I Study, the "increased

¹Robert Rose, Chief, Division of Planning and Research, San Francisco Fire Department, letter to EIP Corp., 19 April 1979 (available for public review at the Office of Environmental Review, San Francisco Planning Department). Highrise fires are controlled from inside the building at upper floors where fire fighting equipment may not gain access from the outside.

²Chief Robert Rose, Division of Planning and Research, San Francisco Fire Department, telephone conversation, 5 May 1980.

³Donald Bentley and Associates, Report for 301 Howard Street Building, April 1979.

⁴John Kenck, Manager, City Distribution, San Francisco Water Department, telephone conversation, 12 February 1980.

demand for water (based on a 65% increase in downtown building space by the year 2000) can be handled by the existing supply system."¹

4. Sewer Service

Potential sewer loads from the project would be generated from domestic uses, cooling tower bleed, and rainfall. All sewage generated would be transported to the North Point Treatment Plant for processing.²

Approximately 76,300 gallons per day, with a peak flow rate of 0.72 cubic feet per second, of sewage would be generated by the proposed project. Annual generation is estimated at 2,600,000 cubic feet per year. In addition, it is estimated that the peak flow rate due to on-site rainfall would be 2.0 cubic feet per second, based on 4.5 inches of rainfall per hour.³

The San Francisco Department of Public Works considers the sewer system in the vicinity of the project to be adequate to handle the wastewater generated by the proposed building.

The Downtown San Francisco Conservation and Development Planning Program Phase I Study⁴ indicates that a 65% increase in downtown sewage flows by the year 2000 would cause a "2 to 3 percent increase in peak wet weather flow."

¹Sedway/Cooke, assisted by the San Francisco Department of City Planning, Downtown San Francisco Conservation and Development Planning Program Phase I Study, October 1979, page 55.

²Nat Lee, Engineering Associate, Division of Sanitary Engineering, San Francisco Department of Public Works, telephone conversation, 20 April 1979.

³Donald Bentley and Associates, Report for 301 Howard Street Building, April 1979.

⁴Sedway/Cooke, op. cit.

I. ECONOMICS

1. Economic Activity and Employment

a. Office and Retail Space

The estimated existing supply of office and retail space in the Central Business District, hereafter referred to as "the Downtown" is 57 million gross square feet.¹ The project would add a total of 389,600 gross square feet of office space to the existing downtown supply of about 57 million square feet without demolition of any existing office space. This would be an increase of less than 1% over existing total downtown office space and a 1.3% increase over downtown high-rise space in 56 office towers built in the period 1945 to 1978.

In a cumulative context, the proposed building would represent about 3.4% of the known office space growth potential which is planned for construction and occupancy in the period of 1979 through 1982 (21 buildings totalling 10.2 million leasable net square footage (see Table 8, page 71).

b. Employment and Tenant Mix

The rentable space would total 310,200 square feet. Employment in the new building would total from about 1,240 to 1,630.² This

¹The 57 million square feet estimate of existing inventory is based upon the 50 million square feet enumerated in a 1974 SPUR-sponsored survey, plus the 7 million square feet of high-rise office space in seven buildings completed through 1979. Detailed Findings: Impact of Intensive, High-Rise Development in San Francisco, Final Report, San Francisco Planning and Urban Renewal Association, and Department of City Planning, City and County of San Francisco, June 1975.

Several estimates are actually lower than 57 million square feet. Elmer Johnson of the Building Owners and Management Association estimates 40 million square feet of office space (telephone conversation, 6 February 1980). Jan Lundquist, Coldwell Banker, estimates about 50 million square feet (telephone conversation, 6 February 1980).

²The lower estimate is based on one employee per 250 rentable sq. ft. The higher estimate was made by Continental Development Corporation assuming employee density similar to that now prevailing at 215 Fremont Street, estimated at one employee per 190 rentable square feet, which may be considered to be overcrowded for the E.P.A. Both estimates include 20 security and maintenance employees.

would represent a 103 to 136% increase in employment in the block, since existing employment at 215 Fremont is 1,200. It is assumed in this report that all employment would represent new jobs. Approximately 44% (545 to 720 employees) would be expected to live in San Francisco, 16% (200 to 260) on the Peninsula, 27% (335 to 440) in the East Bay and 13% (160 to 210) in the North Bay (see Appendix A, Transportation Calculations and Trip Generation Data, Table 32, pages 176 thru 178).

Tenant mix for the proposed building is not known at this time.¹ Pacific Telephone Co. and the Environmental Protection Agency have expressed some interest in horizontal expansion from 215 Fremont Street.

The building would be designed to allow the incorporation of a restaurant on the top floor. (The California Culinary Academy may open a restaurant and/or expand its dining facilities into the new building on the seventh floor or 24th floor in association with its training program.)

c. Rents

Space in the 315 Howard Street Building would be expected to rent for about \$17 per square foot annually or \$1.50 to \$2.00 less annually per leasable square foot than rents for comparable new buildings now leasing north of Market Street.² This is because the cost of land in the project site vicinity (about \$100 per square foot south of Market) is half or less of the cost of land north of Market Street (about \$200 to \$300).² New space downtown now leases for \$18 to \$26 per square foot annually.³

¹Information in this paragraph is based on letters from Allerton Blake, A.I.A., Project Manager, Continental Development Corporation, 22 March 1979, and by telephone communication with W. Gene Mays, Senior Vice President, Continental Development Corporation, 5 April 1979.

²W. Gene Mays, Senior Vice President, Continental Development Corporation, telephone communication, 6 February 1980.

³Harold Nevin, Senior Sales Consultant, Coldwell Banker, telephone communication, 6 February 1980; and J. Stanisch, Senior Real Property Appraiser, Assessor's Office, City and County of San Francisco, telephone communication, 6 February 1980.

d. Construction Employment

An estimated \$21 (1979 dollars) million would be spent on construction and interior finish.¹ Assuming about 40% in labor costs for the shell, and 50% for the interior including direct wages, payroll taxes and fringe benefits, about 8.8 million would be spent on labor. Assuming an annual cost, including wage, tax and benefits, of \$26,000 per construction worker, a total of 338 person-years of construction labor would be generated. Project construction would be expected to take place over an 18-month period; therefore average construction employment would be about 240 full-time jobs at any one time during construction. Peak employment would be 300 persons. Additional short-term employment in design, engineering, planning, environmental and legal services and marketing would also be required.

Secondary temporary employment due to demands for goods and services by construction workers and their families and the construction materials supply industry would also be generated.

e. Revenues and Costs

Assessed Valuation and Property Taxes. Based on replacement costs, the minimum fair market value of the proposed project would be approximately \$28.9 million in 1979 dollars.² Assuming the property would be assessed on the basis of full replacement cost, the assessed value of the project would be \$7,225,000.

¹Shell at \$17 million and tenant improvements at \$4 million.

²The full replacement cost estimate includes the land acquisition cost, interim financing and leasing costs as well as construction costs. See Appendix D.

Table 13

Estimated Project Revenues at Full Occupancy
(1980 dollars)

	<u>Total</u> ¹	<u>City/County</u> ²
Property Tax	289,000 to 340,000	246,000 to 289,000
Payroll Tax ³	123,000 to 161,000	123,000 to 161,000
Utility Users Tax ⁴	70,000	70,000
	482,000 to 571,000	439,000 to 520,000

¹Note that revenues shown do not include revenues from the 215 Fremont Building. The project site and 215 Fremont Building are under a single ownership, Paladin N.V. (see Section II.I., page 52).

²Assumes property tax distribution as in 1978-1979, which is not likely to occur. The San Francisco Unified School District and Community College District, Bay Area Air Quality Maintenance District, and BART would also receive property tax revenues. The ranges are based on 4% (under Proposition 13) and 0.7% (based on bond payments, which will change in several years).

³Lower revenue based on 1,240 employees; higher on 1,630. Both estimates assume 60% employee wages eligible, average annual salary of \$15,000, and 1.1% tax (1980 rate).

⁴Water. The estimated annual water bill for the completed project is \$44,600 (2.748 million cubic feet/year @ 41.4¢/100 cubic feet, plus \$1.13 sewer service charge/100 cubic feet). Tax @ 5% = \$2,000.

PG&E. The total annual PG&E bill is estimated at \$444,000: \$420,000 for electricity (@4.5¢/kwh) and \$24,100 for gas (@27.3¢/therm). Rates provided by Hank Shermund, Clerk, PG&E, telephone conversation, 6 April 1979. Totals based on annual consumption figures projected in Section III.G, Energy Impacts, page 102. Tax @ 5% = \$22,200.

Pacific Telephone. The estimated annual telephone bill is \$830,400, a figure which would vary considerably with type of office tenant. This estimate assumes a monthly telephone bill of \$1,000/5,000 leasable square feet. Tax @ 5.5% = \$45,800.

Total Utility Tax = \$70,000.

Total property taxes would be \$289,000, at the 1% of full value allowed under Proposition 13 (or \$4.00 per \$100 assessed value), plus an additional levy for the repayment of existing bonds previously approved by the electorate (totaling \$340,000 in 1980).

It is not known at present how the property taxes would be distributed in the fiscal year 1981-1982 under the provisions of Assembly Bill 8 and Proposition 4.¹ One estimate of probable tax revenues would be to compare with the 1979-1980 share. Using this rate, the City and County would receive \$246,000 to 289,000 from the project.² Depending on the formula set forth for 1981-1982 fiscal year, the City and County share of property taxes would change.

Other Local Revenues. The project would generate new payroll taxes and utility users taxes, and if a restaurant is incorporated, sales tax revenues (see Table 13, page 114). Addition of a restaurant would decrease estimated payroll tax revenues because the number of employees per square foot is less than for office space.

Municipal Costs and Net Revenues. Additional direct City and County costs attributable to the project cannot be quantified. Existing public works costs (streets, drains, lighting, cleaning) would not be measurably increased.³ Police and fire costs would not increase. MUNI, SamTrans and BART capacity increases are based on the anticipated revenues projected by the transit

¹The passage of Proposition 9, which would limit income tax revenues to the state, would likely reduce subventions to the City and County of San Francisco as a result; i.e., cigarette tax revenues, motor vehicle in lieu revenues. These are taxes based on the number of residents that reside in the City and would relate to the project to the degree the project would add residents to the City (see Section III.K., Growth, page 117). The decrease in subventions would be highly speculative at this time, but would not be significant for that portion attributable to the 315 Howard project.

²The lower figure is at the maximum \$4.00 per \$100 assessed value. The higher figure includes the \$0.97 per \$100 assessed value for bond payments. As the bonds are retired, the tax revenues will decline.

³These services already exist on or near the site.

districts (see Section III.C, Transportation, page 67, and IV.B, page 119).

In the context of cumulative downtown employment growth, a cumulative fiscal impact on MUNI could occur.¹ (See Section III.K, Growth-Inducements, page 117, for indirect cost effects of induced population growth.) It would be expected that the projected revenues to the City and County of San Francisco of from \$439,000 to \$520,000 annually would exceed the incremental costs directly attributable to the project.²

J. HISTORICAL

According to a reference document on the San Francisco waterfront, The San Francisco Waterfront: Report on Historical Cultural Resources,³ early fill in the area of Yerba Buena Cove during the post-Gold Rush era has not been found historically valuable except for the sunken hulks contained in the fill which have been identified by the National Maritime Museum. Since the portion of the cove shoreline in the vicinity of the project site

¹The San Francisco Municipal Railway 5-Year Plan (Draft), 22 February 1979, outlines a number of transit actions in anticipation of growth; however, costs were not addressed in this plan.

²Downtown San Francisco Conservation and Development Planning Program Phase I Study prepared by Sedway/Cooke, assisted by the San Francisco Department of City Planning, October 1979, states that "incremental costs for new Downtown development could exceed incremental revenues by as much as 25 percent" (Summary, page 3). The major costs would primarily be for increased transit improvement, as the report indicates that basic City services such as water and wastewater treatment would be adequate to meet the increased demand. The 315 Howard proposed project would contribute to the cumulative demand for increased transit services, but it is likely that the revenues generated by the project would still exceed municipal costs. Several variables such as increased ridership on BART, more trains and faster service could offset the current deficit of \$1.25 per trip (per commuter) on BART, and staggered working hours, shuttle buses and increased car-pooling could also lessen the demand on MUNI.

³Roger and Nancy Olmsted, The San Francisco Waterfront: Report on Historical Cultural Resources, prepared for Wastewater Management, December 1977.

was quite shallow and consisted of tidewater areas and sand dunes, it is unlikely that large boats would have gained access as far inshore as the project site. In addition, the nature of the fill at the project site is now indicated in view of recent soil borings (see Section II.F, Soils and Seismicity, page 49). It appears that construction of the proposed project would not impact known historic structures, sunken hulks or deposits of historical or archaeological material. This would not, however, preclude the possibility that cultural resource remains exist below the ground surface and may be encountered during construction.

K. GROWTH INDUCEMENTS

The project would add about 310,200 net (rentable) square feet of office space to the downtown supply. The proposed new office space may be partially occupied by the U.S. Environmental Protection Agency, Pacific Telephone Co., and the California Culinary Academy, should they expand from existing space at 215 Fremont Street. Otherwise, the space would be available for relocation or expansion of other San Francisco firms, for firms relocating from outside San Francisco, or for newly forming firms.

In itself, the project would represent an additional 1.3% to the existing high-rise office space in downtown San Francisco and about 3% of similar rentable high-rise office development now being built or proposed for occupancy by 1983.

A total of from 1,240 to 1,630 employees could ultimately be located in the new space. With existing employment on the block at 1,200, daytime population on the block would total 2,440 to 2,830. Approximately 44% (545 to 720) employees would be expected to live in San Francisco, 16% (200 to 260) on the Peninsula, 27% (335 to 440) in the East Bay and 13% (160 to 210) in the North Bay. To the extent that the project attracts new residents or commuters who would not otherwise have been

attracted to San Francisco or the Bay Area, it may be viewed as employment-generating and growth-inducing,¹ and would result in a variety of indirect growth effects. These effects would include additional demand for housing,² now in short supply, demands for a variety of commercial, social, medical and municipal services, and secondary demands on streets, freeways and transit systems.

The project would require no new construction or extension of public service or utility systems and would occur in an already developed downtown urban setting. It would therefore not require any infrastructural improvements that would open or intensify development opportunities that do not already exist.

The project would continue the trend of intensifying office uses in the downtown, specifically south of Market Street. Together with other new office development near the site, it could stimulate further office growth in the immediate vicinity, on lots now used for parking or in low-rise structures containing business services (such as printers and office suppliers) and light industrial uses (such as warehousing). Employee purchasing power could stimulate employee-oriented retail activity in the site vicinity.

¹Net new office employment in San Francisco resulting from a particular project is difficult to determine. A theoretical assumption must be made as to whether the new employment would have occurred without the particular project. In this report, economic effects have been analyzed as gross impacts; that is, the future with the project is compared directly to the present without the project.

²It is estimated that from 40 to 50% of downtown office employees reside in the City. If every job on the site were filled by a person who moved to San Francisco (a highly unlikely assumption), the induced population increase would be less than one-third of 1% (0.27%).

IV. MITIGATION

A. VISUAL QUALITY AND URBAN DESIGN

Cumulatively, from a visual standpoint, the alternative of a lower building would assist in retaining existing views of the bay from hillside locations in the City. (This alternative is discussed in Section IV.D, 21-Floor Alternative, page 141.)

Providing small commercial areas at the ground floor next to the entrance lobby, such as a cigar store, flower shop or newsstand, would enhance pedestrian use of the ground floor area. Such facilities are proposed for the project and their use would be dependent upon final determination by the Planning Department of floor area calculations.

B. TRANSPORTATION

1. Mitigation Measures for Impacts of Proposed 315 Howard Project

Mitigation strategies that would shift additional trips onto public transit systems might not be cost-effective because it appears that all of the public transit systems might suffer from overloading conditions and from a lack of financial resources to expand their service. The most effective mitigation measures to decrease the impacts of the 315 Howard project on traffic circulation and parking are, therefore, those that do not rely on public funding, i.e., van-pooling, car-pooling and flextime. (Major tenants of the 215 Fremont building are on flextime.)

The project sponsor would encourage future tenants and tenants in the 215 Fremont Building to enroll their employees in a car-pool or van-pool program. A bulletin board would be set up at a prominent location in the proposed building for car-pool matching purposes with a map and pins, where employees who are interested in ride-sharing can either leave their names or find other interested employees. This effort would be combined with a car-pool promotional effort among future employees, and those of the 215 Fremont building. Such a program could increase car occupancies by perhaps 8% to 10%. The additional traffic volumes would decrease proportionately. Parking demand would decrease by about 36 to 45 spaces.

A van-pool program -- complementary to the car-pooling effort -- would be more effective. Such programs are gaining the support of employees and employers. A van-pool program costs the employer only minor administrative costs, unless he specifically desires to subsidize it. The project sponsor will designate 6 van-pool parking spaces in the existing parking in the basement of 215 Fremont. Typically, employee-riders pay for the operating costs and for the amortization and insurance, and if their daily commute distance is more than about 20 miles, they make savings below the normal car driving costs, i.e., below the gas and maintenance costs of driving a car.

Nationwide reviews¹ of van-pool programs in large companies indicate that 15% to 20% of vehicle drivers participate. If such a program were to include all employees in the project site, it could potentially involve 90 car drivers (20% of all employee car drivers). The parking demand could thereby decrease by 90 spaces. Assuming an additional 8 spaces would have to be provided for the vans, a net decrease of about 82 spaces would result. Additional van-pools could be filled with employees who currently are not driving a car; i.e., car passengers and transit riders. Six parking spaces for van-pool vehicles would be provided free of charge to bonafied van-pools organized among occupants of both the project and the 215 Fremont building.

¹Alan M. Voorhees & Associates, Van Pool Study for the Federal Energy Administration, 1977.

The project sponsor would contact a representative of RIDES¹ to request assistance in establishing an employee van-pool system.

Staggered work hours and flextime (or variable work hours) are two strategies designed to decrease the peak travel loads on the transit systems and road networks by spreading the travel demand over a longer time period. To the degree possible, travelers try to avoid the peak hours in order to minimize the travel time and discomfort. This trend can be further promoted --and the peak-hour impacts of the proposed project reduced --by allowing or even encouraging employees to adopt different working hours.

Staggered work hours are intended to relieve congestion by scheduling work arrival and departure times over a period of up to 2 hours. Unlike flextime, employees under staggered work hours are assigned to their starting and finishing times. This has a negative effect on ride-sharing (car-pooling or van-pooling) because it limits the range of ride-sharing possibilities. Flextime allows employees to choose their own time of arrival at work within a certain range (7 a.m. to 9 a.m., for example). This concept actually increases the ride-sharing possibilities, because it allows an employee to share a ride with an outside employee who has a different working schedule. Employees should be required to adhere to a regular schedule once they have selected an arrival time. By maintaining a regular schedule it will be easier to maintain ride-sharing habits.

During lease negotiations the project sponsor would encourage tenants to institute staggered work hours, flextime system, and would inform prospective tenants of the availability of the 6 free van-pool parking spaces in the 215 Fremont building basement.

Within a year from completion of the project, the project sponsor would conduct a survey in accordance with methodology approved by the Department of City Planning to assess actual trip generation patterns of project occupants and actual pick-up and

¹A non-profit organization established by CalTrans to set up van-pools for Bay Area commuters.

drop-off areas for car-poolers and van-poolers. This survey would be made available to the Department of City Planning.

Secure and safe bicycle parking facilities would be provided at 215 Fremont relative to the demand generated by project occupants.

To minimize circulation impacts due to deliveries and service vehicles -- especially impacts caused by double-parking -- deliveries would be encouraged at all times to enter the project site from Beale Street. A special off-street truck service entrance would be provided at this side by the project sponsor. The project sponsor would request the San Francisco Department of Public Works to implement a yellow zone on Beale Street adjacent to the proposed project in order to provide parking for those commercial vehicles that would otherwise double-park in the event the off-street service entrance is occupied. Deliveries during the morning and evening rush hours would be discouraged since the dual purpose freight and passenger elevator within the building would not be available for freight use during the rush hours.

The reduced pedestrian levels of service that would result from the project on the Howard Street crosswalk during short periods of the peak hour would be mitigated by various measures. The crosswalk could be widened to provide for more space to pedestrians crossing the street. Alternately, a lengthening of the cycle time for the signals at the intersection would result in an increase of the proportionate time available for the green walk signal.¹ It should be noted that the green walk time could not be simply extended by itself, without reducing the amount of green time available to vehicular traffic on Howard Street, the most heavily traveled street at the intersection. The project sponsor would request the San Francisco Department of Public Works to either widen the crosswalk or to lengthen the signal cycle.

Construction impacts would be mitigated by discouraging construction and truck access to the Howard Street side of the site.

¹The proportion of cycle length required for the flashing DON'T WALK would be reduced as this time is dependent on the street width not the cycle time of the signals. The additional time gained could thus be allocated to the green WALK signal.

Construction traffic would be encouraged to get to the project site from Beale Street only. In order to ease the effect of construction traffic and the sidewalk barricade, the project sponsor would request the San Francisco Department of Public Works to reverse the southern westbound lane from Beale Street to mid-block between Beale Street and Fremont Street into an eastbound lane. Howard Street in front of the project site would then have 2 lanes eastbound and 2 lanes westbound. For about $\frac{1}{2}$ block east of Fremont Street, Howard Street would continue to have 3 lanes westbound and 1 lane eastbound. Temporary sidewalks at least 4 feet wide would be maintained during the construction period, as required by law. Construction workers would be expected to use existing parking spaces in the project area.

For any mitigation measure (such as striping changes, signal modification, channelization, etc.) undertaken to improve traffic conditions adjacent to a proposed project, the project sponsor would fund all costs of the improvements deemed necessary by the appropriate (implementing) agency.

2. Mitigation Measures for Cumulative Transportation Impacts

a. Transit

For MUNI, SamTrans, and BART, the cumulative travel impacts depend largely on their ability to expand their capacities and revenues as planned, i.e., within the set time-frame and within the assumed operating budget. If the planned capacity increases cannot occur as scheduled, or if not enough funds are available to fund the service increases, passenger loads on MUNI and SamTrans vehicles and on BART trains could increase.

A resolution could, be adopted by the Planning Commission that would condition the development of the major office projects to the MUNI, SamTrans and BART capacity expansion, or more specifically to the operation of the new MUNI Metro light-rail vehicles to the increased SamTrans capacity into San Francisco and to the reduction of BART headways to 5 minutes or less.

The other major mitigation measure that would have to be investigated would be the development of a new financing mechanism that would pay for the capacity increases required by the proposed office developments. The cumulative impact section indicated that

additional funding would be required to subsidize the service expansion on AC Transit (\$540,000 per year), Golden Gate Transit (\$700,000 per year), SamTrans (\$420,000 per year), and Southern Pacific (\$313,000 per year). Some of the potential funding mechanisms follow:

- an annual license fee or service charge, based on the square footage and type of development
- a commuter or employee tax, which could be based on income
- a one-time construction fee, building permit fee or in-lieu transit fee
- a downtown assessment or transit service district
- higher fares for transit passengers, maybe only at peak periods or into special areas

The above funding strategies could have important consequences and warrant extensive analyses and studies, beyond the scope of this study.

The project sponsor recognizes the need for the expanded transportation services to meet the peak demand generated by cumulative office development in downtown San Francisco to which this project would add; therefore, the project sponsor would participate in a downtown assessment district, with annual or monthly assessments, or similar nondiscriminatory mechanism, to provide funds for service, in an amount not to exceed the demand created by the project, should such a mechanism be established by the City. The currently proposed one-time construction fee, if enacted by the City, would constitute the project sponsor's contribution for the maintenance and the augmentation of transportation services.

b. Traffic and Parking

Traffic and parking mitigation measures of the proposed 315 Howard project would be on ride-sharing measures, flextime measures and use of other modes such as bicycling and walking. An ordinance could be passed by the Board of Supervisors that would require each new office project to provide a minimum amount

of free parking spaces for van-pool purposes, in the same way that a minimum or maximum amount of general parking is required by the Planning Code. The project sponsor has committed to provide six free parking spaces for van pools, and free bicycle parking areas at 215 Fremont.

C. NOISE

The proposed site is in an area where the L_{dn} is 70 to 75 dB. In accordance with the suggestions included in the Transportation Noise Element of the Comprehensive Plan of the City and County of San Francisco, a detailed analysis of the noise reduction requirements of the proposed building would be made prior to final design, and needed noise insulation features would be included in the design. This analysis would be supplied to the Office of Environmental Review. To mitigate pile-driving noise impact, the City of San Francisco has in the past issued special permits to require pile-driving to take place when the least number of people would be impacted. For the project site, that would be after office hours at the 215 Fremont Building and on weekends. In addition to restricting the hours of operation, the City has employed another mitigation measure which has minimized pile-driving noise impacts: predrilling the pile holes to minimize the depth through which the piles would have to be driven. This both minimizes the number of blows per pile, and therefore the number of noise-generating impacts, and also keeps the pile hammer closer to the ground, where shielding due to adjacent buildings is more effective. The project sponsor has committed to employ this measure of pre-drilling pile holes. Noise barriers between the pile drivers and the building would be effective in mitigating levels at lower floors by up to 15 dBA. Upper floors would not be shielded unless the barriers were as high as the floor in question. The project sponsor would provide pre-drilling of pile holes and is prepared to commit to other measures if required by the city under existing ordinances.

D. CLIMATE AND AIR QUALITY

1. Climate

To mitigate the uncomfortable buffetings of project-induced winds, the project sponsor has stated that street tree plantings would be installed in the ground around the perimeter of the building as well as in portable planters around the ground floor plaza.¹ These would be located so as not to interrupt pedestrian flows. They would act as a partial windbreak for winds being channeled down the windward face of the building and for random eddies that would carry dust or debris.

The alternative of a lower building would lessen wind impacts. Pedestrian comfort would also be enhanced as shadows would be reduced allowing for more sun to raise ambient temperatures. (See Section VII.D, page 141, for discussion of a reduced height alternative.)

2. Air Quality

The project's location in the downtown area of San Francisco can be viewed as a mitigation measure for regional air quality. The combination of transit access from the S.F. Municipal Railway, BART, AC Transit, SamTrans and Golden Gate buses results in an estimated 60% non-auto transportation split. The other 40% of the trips made by automobile would add to the already heavy traffic volumes existing in this area.

The measures discussed in Section IV.B, Transportation Mitigation, page 119, would also mitigate air quality impacts. These measures would include car-pooling, van-pooling and staggered work hours.

Watering to control dust on the site during construction would be provided by the project sponsor. The San Francisco Building Code requires that measure be taken to reduce dust generation, specifically, watering down demolition materials and soils. An

¹As shown on Figures 3, 4 and 5, pages 14, 15 and 16. Allerton Blake, Project Manager, Continental Development Corporation, written communication, 14 June 1979.

effective watering program (complete coverage twice daily) can reduce emissions by about 50%.

E. GEOLOGY AND SEISMICITY

A geological report for the project has been prepared by Harding-Lawson Associates. The project sponsor would adhere to the recommendations contained within this report as they would represent the state-of-the-art on safe design for constructing within a seismically active area.

The project sponsor would require the structural engineer to provide the design of the structural elements of the project to be greater than the requirements set forth in the current San Francisco Building Code. The structural design would be based on the more restrictive 1976 Uniform Building Code rather than the current San Francisco Building Code. A computer analysis of the structural frame would be performed to design the seismic restraint of the structural frame. Steel reinforcement would be added to the pre-cast concrete piles so that the structural characteristics of the piles would be consistent with the seismic restraint of the structural frame.¹

F. ENERGY

New nonresidential construction initiated after 1 July 1978 is required to comply with Title 24, Division 20, Article 2 of the California Administrative Code regarding Energy Conservation Standards for New Nonresidential Buildings. Designed to help reduce energy consumption in California, these regulations set forth design criteria for buildings and stipulate maximum allowable energy consumption figures. Under the law, the project sponsor would have to conform with these standards.

¹Letter from Continental Development Corporation to Environmental Impact Planning Corporation, 5 May 1980.

Title 24 regulations set a maximum allowable energy consumption for nonresidential buildings with an occupancy of over 300 persons of 126,000 Btu per gross square foot of heated and cooled floor space per year.¹ The total annual energy consumption for this building will be less than the maximum 126,000 Btu per gross square foot of heated and cooled floor space, when the building systems are operated in accordance with the load profiles for Occupancy Reference Number V of the Title 24 Energy Budget Performance Standards.

1. Electrical

The following electrical energy conservation design measures would be implemented for the building:²

- a. Lighting loads would be restricted in compliance with Title 24 standards, i.e. approximately 2.3 watts per square foot for office areas.
- b. Dual-level lighting controls would be provided in all office areas to permit lighting levels to be reduced by 50% during periods when higher illumination levels are not required.
- c. A centralized lighting control system would be installed to permit master "off" control of lighting fixtures when the building is not occupied.
- d. Recessed fluorescent lighting fixtures would be provided with heat extract capability to increase lighting efficiency and reduce the amount of heat transmitted to the office space, hence reducing the horsepower rating of supply

¹California Energy Commission, Conservation Division, Regulations Establishing Energy Conservation Standards for New Residential and New Nonresidential Buildings as Amended 26 July 1978, Sacramento, 1978, Table 2-1.

²The Engineering Enterprise, Consulting Electrical Engineers, 301 Howard Office Building Electrical Input for EIR Statement, Berkeley, March 1979.

fans and chillers for the ventilating and air conditioning system.

- e. The electrical power distribution system would use low impedance fixtures to reduce transmission losses and increase system efficiency.
- f. High efficiency lighting sources (fluorescent and high intensity discharge lamps) would be used to maximize light output and minimize the connected lighting load.
- g. Automatic reduction of perimeter zone lighting levels would be actuated by light sensitive photo cells.
- h. Economizer cycle on air systems to use the maximum amount of outside air and minimize the amount of cooled air.
- i. High limit, thermostatically controlled recirculation and exhaust dampers to minimize the effect of conditions when outside air temperatures exceed the return air temperatures.

2. Natural Gas

The following design measures would be installed to reduce the natural gas consumption of the building:¹

- a. Insulation of the exterior building walls and roof to minimize solar and transmission heat gains and losses to and from the building.
- b. Sealing of the building envelope to prevent the infiltration of cold outside air in winter and hot humid air in summer.
- c. Use of variable volume air conditioning systems with low static pressure type terminal units and ductwork in the occupied spaces to minimize energy usage.
- d. Variable volume heating and chilled water piping distribution systems to minimize energy usage.

¹Donald Bentley and Associates, Report for 301 Howard Street Building, April 1979.

- e. The use of minimum ventilation rates consistent with accepted industry-wide standards and codes.
- f. Provision of optimum thickness of insulation for ductwork, piping and equipment.
- g. The use of high efficiency type air conditioning and domestic water heating equipment.
- h. The use of automatic temperature control systems that would reset the system cold air supply temperature to the highest level that would satisfy the zone requiring the most cooling.
- i. The use of devices in wash rooms to limit water outlet temperatures to 110°F.

The architects for the proposed project point out that the semireflective glass proposed for the building's exterior window wall has the following characteristics:¹

- a. Reflective glass reduces solar heat gain by 33% compared to conventional tinted glass, and by 50% compared to clear glass,² thereby reducing the structure's air conditioning loads. Computations by the project mechanical engineer show resultant annual savings of up to 15,000 BTU per square foot of floor area compared to conventional tinted glass.³

¹Gensler and Associates, Architects, Memorandum, 315 Howard, 2 March 1980.

²Pittsburg Plate Glass Co. "Architectural Glass Products," 1979 Sweet's Catalog page 8.26/Pp-16:

- Solarcool Gray Reflective Glass: 103 BTU/hr-sq.ft. Relative Heat Gain
- Solargray Tinted Glass: 154 BTU/hr-sq.ft. Relative Heat Gain
- Clear Glass: 204 BTU/hr-sq.ft. Relative Heat Gain

³Donald Bentley and Associates Memorandum, 3/2/80.

- b. The glare-reducing and radiant heat-reducing properties of reflective glass, combined with its relatively high visible light transmittance, would induce occupants to leave blinds and drapes open, thereby increasing the level of natural light. Since the solar heat reduction properties of reflective glass are not dependent upon blinds or drapes being drawn, there would be an additional net reduction in energy usage derived from reduced electric lighting usage and a resultant drop in heat gain.

Architects for the proposed project state the lower third of the southwest and southeast faces of the building, through the 9th Floor, are shaded from solar heat gain by the existing 215 Fremont building, which is 109 feet high excluding mechanical penthouses.¹

G. COMMUNITY SERVICES

1. Water

The domestic water system design would include water conservation devices wherever possible. The following techniques have been incorporated into the planning of the proposed building in an effort to minimize overall usage of domestic water.

- a. Lavatories and drinking fountains would be provided with flow control devices.
- b. Lavatories would be furnished with self closing type valves to limit the water delivery per each opening of the valve.
- c. Flow control devices would be provided for all showers.

¹Gensler and Associates, Architects, Memorandum, 315 Howard, 2 March 1980.

H. HISTORICAL

If artifacts or archaeological remains are discovered during excavation or construction of the proposed project, the contractor would stop work in the area of the find to permit professional evaluation of the find. Should artifacts or archaeological remains be found, the Environmental Review Officer and the President of the Landmarks Preservation Advisory Board would be notified. Any artifacts found would become the property of the project sponsor.

The Environmental Review Officer would recommend mitigation measures, if necessary. All recommendations would be sent to the State Office of Historic Preservation. Excavation or construction that may be damaging to the cultural resources discovered would be suspended for a maximum of 4 weeks to permit inspection, recommendation and retrieval (if appropriate).

V.
UNAVOIDABLE ADVERSE IMPACTS

A. TRANSPORTATION

No new parking spaces would be provided by the project. The project would generate an estimated parking demand of 405-414 long-term spaces and 140 short-term spaces, after car pool and van pool programs are effective.

A total of about 10.2 million square feet of office space in 21 buildings would be added to the downtown area by 1982, including the proposed project. The cumulative impacts on transportation would be in proportion to the square footage of floor space. The 1982 cumulative number of vehicle trips estimated to be generated by downtown San Francisco office developments either under construction or proposed north and south of Market Street, would be about 59,800 daily trips and 10,000 trips during the evening peak hour. Existing delays would be increased, and the peak period would be extended in length throughout much of the downtown area. It is estimated that the vehicular traffic generated by 315 Howard Street would contribute about 3% to 4% of the cumulative traffic impacts of these projects.

The 315 Howard Project would represent 2% of estimated 1982 transit system ridership increases. For MUNI and BART the cumulative travel impacts would depend largely on their ability to expand their capacities as planned, i.e., within the set time frame and within the assumed operating budget. Additional funding would be required to subsidize the service expansions on AC Transit (\$720,000 per year), Golden Gate Transit (\$725,000 per year) and Southern Pacific (\$363,000 per year).

B. NOISE

Because the building at 215 Fremont shares the property line with the proposed construction site, noise-generating activities would occur within 5 or 10 feet of the outside of the building. At this distance noise levels inside the nearest offices with the windows closed could reach 95 to 100 dBA during pile driving.

C. GEOLOGY AND SEISMICITY

If an earthquake of a maximum estimated magnitude of 8.25 on the Richter scale were to occur along the San Andreas Fault, the project site would experience groundshaking, which could have an effect as serious as cracking of the building walls and permanent deformations of structural members.

D. ENERGY

Assuming a 50-year lifetime for the building and an energy cost for construction and removal of 41 billion Btu each, or 82 billion Btu total, then the estimated lifetime energy cost of the proposed project is 2.5 trillion Btu; this is equivalent to approximately 470,000 barrels of oil.

VI.
THE RELATIONSHIP BETWEEN
SHORT-TERM USES OF THE ENVIRONMENT
AND LONG-TERM PRODUCTIVITY

The project's economic productivity would be determined by its financial return to the City of San Francisco and the money which would be spent in the City by those who would work at the proposed project. City tax revenues would increase as well as opportunities for employment under anticipated business expansion, through time, as the building is filled with occupants after completion.

The project would be a long-term use, estimated at 50 years or more, spanning several generations. In this time period, other options for land use on the project site would be precluded because the land use proposed would likely remain stable unless financial imbalances within the regional economy occur. Construction of the proposed project at a later date would entail increased construction costs. Revenues to the property owner, employees who would work in the building and revenues to the City would be postponed.

VII.
ALTERNATIVES TO THE PROPOSED PROJECT

A. NO-PROJECT ALTERNATIVE

1. Existing Development

If the proposed project is not constructed, present use of the site as a parking lot would exist for an unspecified period of time. With the retention of the site in its current condition, none of the identified impacts associated with the proposed project would be exerted on the downtown area.

The no-project alternative would hold open future options for the land to be developed under other scenarios (see VII. A.2. below). Deferment of development could give time for the emergence of societal mechanisms to alter existing zoning codes affecting the ultimate build-out potential of the site, including increased restrictions on building bulk.

2. Alternative Site Uses

Under the C-3-S zoning, other possible site uses include commercial, business services and wholesaling (see Section I.D, Zoning and Required Approvals, page 19). In addition, with a Conditional Use permit, residential and parking garage uses would be allowed.

Possible commercial and business uses include hotel, sales, restaurant, commercial and other services available to the public. Such uses generate trips at a higher rate on a daily basis than office space and it would be possible that larger impacts on traffic, transit, pedestrian flow, and noise would occur for a project of equal size to the proposed

project. However, because the site is located at the fringe of the Central Business District, it is unlikely that the site would be intensively developed for either of these purposes.

A wholesaling operation would be a less intensive use of the site than the proposed project; it would have less impact on energy, automobile traffic, transit and pedestrians. Truck traffic, however, would increase. Tax revenues would likely be less than for the proposed project, as would employment.

Trip generation due to residential use of the site would likely be lower than the project as proposed because fewer individuals would enter and leave the site on a daily basis. This would vary, depending on the size of the residential development and number of dwelling units constructed. Peak-hour trips would be outbound in the morning and inbound in the evening, in reverse to those for the proposed project and for the Central Business District in general. Traffic impacts would be expected to be less, while pedestrian and transit impacts would be either greater or less, depending on where the majority of residents would travel to work. Residential energy use per unit area of floor space would be higher than for office space because of 24-hour heating and the use of appliances and kitchens.

If the site were developed as a commercial parking garage, total trip generation would be less than the project as proposed and impacts on transit would be less. However, the number of trips ending and originating on the site would be greater, in turn increasing impacts on traffic conditions, the noise environment and air quality in the immediately adjacent area.

B. DEVELOPMENT UNDER PROPOSED INITIATIVE (PROPOSITION O)¹

On 2 March 1979, San Francisco Tomorrow, a citizens' urban conservation group, filed a notice of intent to circulate petitions to place an initiative on the November 1979 ballot to limit the height and floor area ratios (FAR) of buildings to be constructed in downtown San Francisco. San Francisco Tomorrow gave the following reasons for sponsorship of the initiative:²

- a. Increasing traffic congestion and parking problems.
- b. Increasing air, noise and water pollution.
- c. Creating a dark, windy and uninviting downtown area.
- d. Increasing the demand on over-burdened public services such as fire, police, public transit and sewer facilities.
- e. Increasing the cost of said public services.
- f. Placing an increasing demand upon the limited housing stock of San Francisco and thus contributing to rising housing costs in San Francisco.
- g. Contributing to an overall decline in the quality of life in San Francisco.

The measure qualified for the ballot in June 1979. If the measure had passed, the maximum height for any new building

¹This section was prepared prior to the November 1979 election in which Proposition O was defeated. The analysis has been retained for informational purposes. In response to public concerns represented by Proposition O, the Planning Commission placed a moratorium on floor area bonuses. However, this bonus moratorium does not apply to the proposed project. See Section I.D, Zoning and Required Approvals, page 19, for a discussion of this issue.

²San Francisco Tomorrow, "Initiative to Limit the Height and Floor Area Ratios of Buildings in Downtown San Francisco (Summary)," 28 February 1979.

in downtown San Francisco would have been 260 feet, about 20 stories.¹

The downtown area includes the C-3-S zoning classification in which the project site is located (Downtown Support District; see Section I. D., Zoning and Required Approvals, page 19). The initiative would have changed the existing height and FAR of the C-3-S district accordingly:

<u>Current Height Limit</u>	<u>Proposed Height Limit</u>
up to 340 feet	130 feet
<u>Current FAR Limit</u>	<u>Proposed FAR Limit</u>
7 to 1 plus bonuses	5 to 1 plus bonuses

¹The Downtown San Francisco Conservation and Development Planning Program, October 1979, prepared by Sedway/Cook, assisted by the San Francisco Department of City Planning, outlined a number of interim growth controls for the C-3 zoning district. These controls addressed protection of the pedestrian environment; preservation of architecturally and historically significant buildings; preservation of rental housing, apartment units and residential hotels; preservation of "blue-collar" employment opportunities; preservation of parking options; FAR, height and bulk limits; bonuses; view protection and energy conservation. The interim controls were proposed to preserve planning options and to prevent conditions from substantially changing during the approximate 21-month period in which a Master Downtown Plan would be prepared. Page 72 of the report notes:

" . . . if Proposition O is adopted by the voters, it would place substantive limitations on the interim controls with respect to basic and bonus floor area ratio (FAR) and height regulations. As provided by Proposition O, the interim controls may only lower any basic FAR or height limit the proposition establishes. Proposition O further limits the interim controls to granting bonus FARs only in exchange for significant public benefits that would derive from encouragement of public transit usage, energy conservation beyond the standard mandated by law, improvement of the pedestrian environment, and development of new housing in San Francisco."

Another study, Downtown Growth Management Program, October 1979, prepared by Livingston and Bolles for the San Francisco Chamber of Commerce, reviewed zoning regulations in the C-3-0 district and provided alternative recommendations to the provisions of Proposition O.

The measure would have preserved any existing limits lower than these and would have allowed lower limits to be established through amendments to the City Planning Code. The above limits could not be increased without a public vote. The initiative would have abolished all existing bonus provisions and in its place there would have been a system of new bonus provisions, including those awarded for improving public transit, conserving energy, improving the pedestrian environment, creation of new housing at other sites, or substantial efforts to mitigate adverse environmental impacts of a proposed development. No new project could have exceeded the maximum FAR established by the initiative, which in the C-3-S district would have been 8:1 including all bonuses. The initiative would have applied to all buildings for which all rights had not vested as of the date the initiative qualified for the ballot. It would also have provided that no rights may vest after the date of qualification. With respect to the proposed project, under the terms of the initiative the proposed building could not have exceeded 130 feet in height (a reduction of about 190 feet in the proposed structure). At a proposed FAR of 5:1, the proposed building would not have contained more than about 43,100 gross square feet, exclusive of bonuses, while a FAR of 8:1 inclusive of all bonuses would allow a structure containing about 258,800 square feet.¹

Under these conditions, a FAR of 5:1, excluding bonuses, would allow a building to be constructed not exceeding 2-1/2 stories in height, assuming total lot coverage, while an 8:1 FAR including all bonuses would allow a building about 13½ stories in height, assuming total lot coverage.

In either event, if a smaller building were constructed on the site, the impacts identified would be proportionately less than for the proposed project, particularly in the areas

¹As proposed, the building would contain about 389,600 gross square feet.

of traffic, transit, pedestrian flow, noise and energy consumption. The project sponsor considers this alternative economically infeasible to build.¹

C. ALTERNATIVE DESIGNS

The project sponsor states the proposed building design was derived from analysis of about 30 studies of schemes showing various configurations based on gross floor area calculations with possible bonuses provided for in the zoning code² (see Section I.D, Zoning and Required Approvals, page 19). The stated objective was to arrive at a building through the aid of bonuses to maintain large typical floor areas to accommodate anticipated use by multifloor tenants. An additional design consideration was "...to provide natural light at the back sides as well as to maintain the natural light at the existing building."¹ Early design schemes that filled the site tended to result "...in rather squatty-looking buildings."¹

"The final scheme represents the best compromise to accomplish the desired results in that the typical floor area is somewhat less than desirable for the bulk user, but the ten-foot setback between the new and existing buildings is accomplished and the width-to-height ratio is aesthetically desirable."²

D. 21-FLOOR ALTERNATIVE

1. Project Characteristics

This alternative would contain 21 floors (excluding the penthouse level) and a gross floor area of 343,400 square

¹Allerton Blake, Project Manager, Continental Development Corporation, telephone communication, 8 August 1979.

²Allerton Blake, Project Manager, Continental Development Corporation, written communication, 22 June 1979.

feet. The building would rise 293 feet in height and measure approximately 128 feet on each side (see Figure 28, page 143). The floor area ratio would be 8:1. The building location and design would be the same as for the proposed project. Construction cost is estimated at \$18.5 million (1979 dollars) and the construction schedule would be 18 months.

The following sections describe the impacts of this alternative which differ from those of the proposed project.

2. Visual Quality and Urban Design

The height of this alternative would be 27 feet lower than that of the proposed building. An architectural model of this alternative has been constructed. Figure 29, page 144, shows a photograph of the model illustrating a pedestrian view of the lower portion of the building as seen from the north side of Howard Street. Figures 30, 31 and 32, pages 145, 146 and 147, depict views of the model from 3 vantage points north of the building. These photos illustrate the variation in revealing construction details of the building that would occur as the sun strikes the building from different angles.

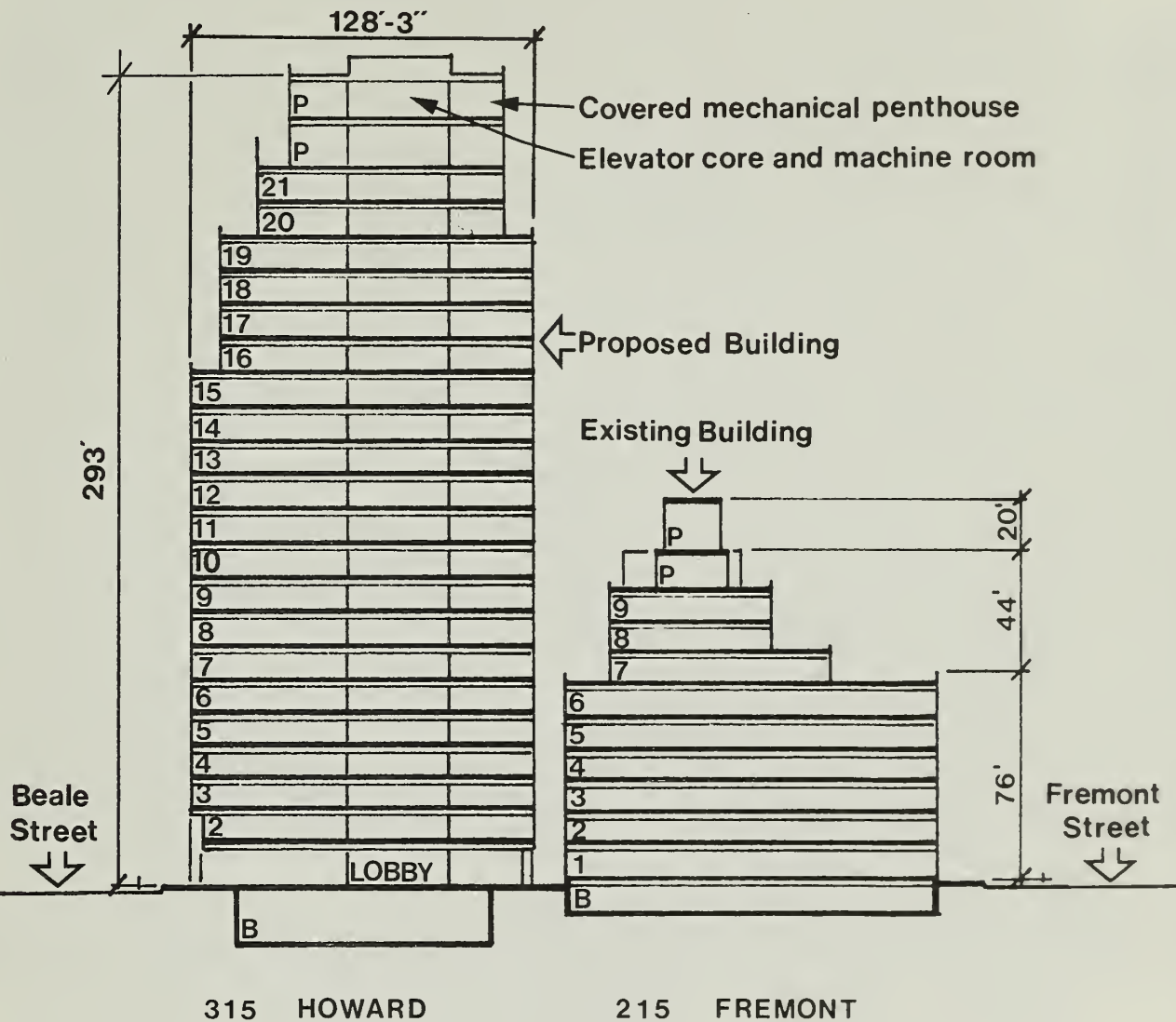
3. Land Use and Zoning

Approximately 343,400 gross square feet of office space would replace the present uses on the site.

As of March 31, 1980 a determination had not been made by the Zoning Administration as to whether the gross square footage would be within the limit allowed by the Planning Code, considering allowed bonus provisions.

4. Transportation

Based on a total area of 268,800 square feet of net leasable office space, this alternative would generate a total



**Section Through Building-
21 Story Alternative**

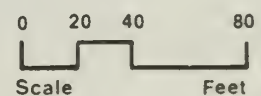


Figure No.28



Model Photograph-

Pedestrian view from north side of Howard Street

Figure No. 29



Model Photograph -
View from northeast of the Building

Figure No.30



Model Photograph -
View from north of the Building

Figure No.31



Model Photograph -
View from northwest of the Building

Figure No.32

of 4,670 daily person-trips, 25% less than the 6,200 person-trips estimated for the proposed project. During the afternoon peak hour, the proposed alternative would generate the following numbers of person-trips by mode of travel:

Car Driver	255
Car passenger	41
MUNI	306
BART	143
AC Transit	63
Golden Gate Buses	40
SPRR	32
Greyhound, charters, jitneys	26
Walk	66
Ferries	16
SamTrans	<u>9</u>
Total with transfers	997
Total without transfers	946

The transportation impacts of this project alternative would be about 25% less than for the proposed project for all modes of travel and for parking.

The cumulative transportation impacts would be about 3/4 of 1% less than with the proposed project. The proportionate share of the total cumulative transportation impacts for this alternative would be about 2.6%, compared to 3.4% for the proposed project.

5. Climate and Air Quality

Because of the reduced height of this alternative compared to the proposed project, the wind impacts would be lessened and pedestrian discomfort would be reduced. (See Section IV.D, Climate and Air Quality Mitigation, page 126.) Although

the shadows cast would be shorter in all seasons of the year, there would be no reduction of shadow impact on sidewalk areas.

As the transportation impacts of this alternative would be about 25% less than for the proposed project, air quality impacts for both local and regional pollutants would also be about 25% less.

6. Economics

The 343,400 gross square feet of office space would represent about 3% of the known office space growth potential planned for construction and occupancy in the period 1979-1982. Rentable space would total 268,800 square feet. A permanent occupancy of about 1,100 to 1,400 persons would be expected. Tenant types would remain the same as for the proposed project.

Average construction employment would be about 190 full-time jobs, with peak employment around 280. Assuming an annual cost including wages, tax and benefits of \$26,000 per construction worker, a total of 296 person-years of construction labor would be generated.

Based on replacement costs, the minimum fair market value of the proposed project would be approximately \$24.2 million in 1979 dollars (including land, construction costs for both shell and interior finish, interim financing and leasing costs). Total property taxes would be \$242,000 at the 1% of full value allowed under Proposition 13. Although the exact distribution of property taxes to the City and County of San Francisco is not known beyond 1980, based on the current allocation the City would receive between \$138,000 to \$196,000.

The project would also generate new payroll taxes and utility users taxes. The total expected revenues to the City and County could range from \$310,000 to \$399,000 as shown on the following table.

TABLE 14

Estimated 21-Floor Alternative Project Revenues
at Full Occupancy (1980 dollars)¹

	<u>Total</u>	<u>City/County</u>
Property tax	\$242,000 to 296,000	\$138,000 to 196,000
Payroll tax	109,000 to 139,000	109,000 to 139,000
Utility users tax	<u>64,000</u>	<u>64,000</u>
	\$415,000 to 499,000	\$310,000 to 399,000

¹The same assumptions are used in this table as in Table 13, page 114.

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X. BIBLIOGRAPHY

Association of Bay Area Governments. Draft Environmental Management Plan. December 1977.

Bay Area Air Quality Management District. Air Pollution in the Bay Area by Station and Contaminant, 1978. March 1979.

California Energy Commission, Conservation Division. Regulations Establishing Energy Conservation Standards for New Residential and New Nonresidential Buildings as Amended 26 July 1978. Sacramento, 1980.

City and County of San Francisco, Department of City Planning. Final Environmental Impact Report, Crocker National Bank. EE 78.298. 1979.

City and County of San Francisco, Department of City Planning. Final Environmental Impact Report, Federal Reserve Bank of San Francisco. EE 78.207. 1979.

City and County of San Francisco, Department of City Planning. Final Environmental Impact Report, 595 Market Street. EE 74.322. 1975.

City and County of San Francisco, Department of City Planning. Final Environmental Impact Report, Levi's Plaza. EE 77.256. 1978.

City and County of San Francisco, Department of City Planning. Final Environmental Impact Report, 101 California Street Project, San Francisco, California. EE 78.27. 1979.

City and County of San Francisco, Department of City Planning. Final Environmental Impact Report, Pacific Gateway Office Building Project. EE 78.61. 1979.

City and County of San Francisco, Department of City Planning. Final Environmental Impact Report, 333 Market Street Building. EE 77.98. 1977.

City and County of San Francisco, Department of City Planning.
Final Environmental Impact Report, Yerba Buena Center.
January 1978.

City and County of San Francisco, Department of City Planning.
Urban Design Plan. Adopted 26 August 1961.

City of San Francisco. City Planning Code. Section 210.3.

Donald Bentley and Associates. Environmental Impact Report
for 301 Howard Street Building. San Francisco, April 1979.

Engineering Enterprise, Consulting Electrical Engineers.
"301 Howard Office Building Electrical Input for EIR Statement."
Berkeley, March 1979.

Environmental Impact Planning Corporation. Energy Impact
Handbook. San Francisco, 1976.

Harding-Lawson Associates. Logs of Borings 1, 2, 3, and 4,
301 Howard Street, job no. 9763,001,04. 28 March 1979.

Harding-Lawson Associates. Preliminary Conclusions and Recom-
mendations of Foundation Investigation for 301 Howard Street.
Letter to Environmental Impact Planning Corporation, 23 April
1979.

Jennings, C.W. "Fault Map of California." California Division
of Mines and Geology, 1975.

Marconi, William. "Commercial Vehicles in a Large Central
Business District." San Francisco Department of Public
Works, no date.

Olmsted, Roger, and Olmsted, Nancy. The San Francisco Waterfront:
Report on Historical Cultural Resources. San Francisco,
December 1977.

San Francisco MUNI. Municipal Railway Five-Year Plan (Draft).
22 February 1979.

San Francisco Planning and Urban Renewal Association, and City
and County of San Francisco, Department of City Planning.
Detailed Findings: Impact of Intensive, High-Rise Development
in San Francisco, Final Report. June 1975.

San Francisco Tomorrow. "Initiative to Limit the Height and Floor Area Ratio of Buildings in Downtown San Francisco."
24 January 1979.

Tetra Technology, Inc. Energy Use in the Contract Construction Industry. Arlington, Virginia, 1975.

URS/John A. Blume. San Francisco Seismic Safety Investigation.
Prepared for Department of City Planning, San Francisco.
June 1974.

U.S. Department of Transportation. Draft Environmental Impact Statement, San Francisco Bay Area Transportation Terminal Expansion. 1979.

Alan M. Voorhees & Associates. Van Pool Study for the Federal Energy Administration. 1977.

APPENDIX A
TRANSPORTATION CALCULATIONS
AND
TRIP GENERATION DATA

APPENDIX A

TRANSPORTATION CALCULATIONS AND TRIP GENERATION DATA

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NOTE: Since preparation of the transportation analysis in May 1979, commercial space use has been factored out of the proposed project and there has been a reduction of about 6,000 square feet in net rentable office space. None of these decreases have required changes in the calculation of transportation impacts because they fall within the +10% level of statistical validity of the methods used to predict the impacts.

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April, 1979

1. CALCULATION OF EXISTING P.M. PEAK-HOUR MUNI CAPACITY AND RIDERSHIP TO PROJECT AREA

The MUNI capacity supplied to the study area during the afternoon peak-hour is defined as follows: For each MUNI line serving the area within 1500 feet from the proposed project site, the average number of vehicles scheduled for the afternoon peak-hour is multiplied by the recommended maximum passenger load^{1/} for each vehicle type. Since several brands of buses, with different capacities are used in the motorcoach category, the average weighted recommended maximum passenger load for the current fleet of motorcoaches has been used. Table 30 shows the MUNI lines serving the project site with their capacity calculation for the afternoon peak-hour (column c).

The p.m. peak-hour ridership estimates are based primarily on the 1976 Annual Passenger Report prepared by MUNI. No complete passenger report has been published since then, even though individual passenger counts were taken on most routes. To update the 1976 ridership estimates for each line, a 1976-1979 growth factor has been developed on the basis of MUNI counts (1978-1979) of the most heavily traveled lines surveyed that serve the project area. If only the p.m. peak-hour (4:30-5:30 p.m.) is considered, the data show a 5% decrease in ridership from 1976 to 1979. For the 4 p.m. to 6 p.m. peak period ridership has increased by 1.6%. This 1.6% growth has been used to adjust the 1976 ridership on all lines serving the area, except for those where recent counts were available. In each case, the highest one-hour volume within the 4 to 6 p.m. period was used.

Based on the average peak-hour capacity of each line and on the ridership counts, peak-hour volume/capacity ratios have been developed for each line and for all the lines combined. A volume/capacity ratio of less than 1.0 indicates that that line or group of lines are operating

^{1/} Source: San Francisco Municipal Railway 5-Year Plan 1979-1984 (Draft), 22 Feb. 1979, p. 20. It should be noted that the Recommended Maximum Passenger Load is less than the maximum passenger load that can be accommodated under "crush" conditions.

Below the recommended maximum passenger load for peak-hour conditions. As shown in Table 30, the MUNI lines serving the project site currently operate with an average peak-hour volume/capacity ratio of 0.69. This reepresents average loading conditions where all seats are occupied and there are about 3% standees. This represents average conditions on all lines and conditions vary from line to line. Lines 11 and 38 exceed the recommended maxmium passenger load. Note also that these loads are based on average scheduled vehicle frequencies and on single-day ridership counts (not all on the same day). The probable error in estimates could be greater than 10%.

2. CALCULATION OF STREET CAPACITIES

The street capacity calculations are based on the methodology presented in the Highway Capacity Manual (Highway Research Board, Special Report 87, 1965, pages 131 through 146). They take into consideration the actual approach width of each street, the local street conditions, the geographical conditions and the actual % green time measured for each approach. The capacities and % green time are the following for the streets under consideration:

<u>Street Section</u>	<u>Approach Volume</u>	<u>% Green</u>	<u>Capacity</u>
Beale (Mission - Howard)	6,000	42%	2520
Howard (Main - Beale) WB	2,400	58%	1390
Howard (Main - Beale) EB	1,375	58%	800

TABLE 30

1979 P.M. PEAK HOUR CAPACITIES, RIDERSHIP AND VOLUME/CAPACITY RATIOS
FOR MUNI LINES SERVING PROJECT SITE

Line #	Vehicle ^{1/} Type	Recommended ^{2/} Maximum Passenger Load (a)	Avg. No. ^{3/} of Vehicles During PM Peak Hour (b)	Line Capacity (a) x (b) = (c)	Estimated PM Peak Hour ^{5/} Ridership (d)	Volume/Capacity Ratio (d) / (c)
<u>Mission Street</u>						
9	TC	75	13.3	998	447	.45
11	MC	69.7 ^{4/}	6.7	467	518	1.11
12	TC	75	13.3	998	647	.65
14	TC	75	13.3	998	917	.92
14L	MC	69.7	-	-	-	-
14GL	MC	69.7	4	279	272	.97
14X	MC	69.7	8	558	571	.98
Subtotal				4298	3372	.78
<u>Transbay Terminal</u>						
27	MC	69.7	4	279	183	.66
38	MC	69.7	30	2091	2118	1.01
J	SC	95	10.9	1035	844	.82
K	SC	95	17.1	1625	805	.50
L	SC	95	20	1900	{ 882 }	.79
M	SC	95			{ 614 }	
N	SC	95	17.1	1625	1317	.81
Subtotal				8,555	6763	.79

1/ TC = Trolley Coach, MC = Motor Coach, SC = Street Car, CC = Cable Car.

2/ San Francisco Municipal Railway, Five-Year Plan, 1979-1984 (Draft, 22 February 1979), P. 20.

3/ Ibid, p. 29-34, indicates August 1978 Route Data

4/ Based on average vehicle mix of 1979/1980 motorcoaches.

5/ The highest hour between 4 and 6 p.m., generally 4:30 to 5:30 p.m.

TABLE 30

1979 P.M. PEAK HOUR CAPACITIES, RIDERSHIP AND VOLUME/CAPACITY RATIOS
FOR MUNI LINES SERVING PROJECT SITE

Line #	Vehicle ^{1/} Type	Recommended ^{2/} Maximum Passenger Load (a)	Avg. No. ^{3/} of Vehicles During PM Peak Hour (b)	Line Capacity (a)x(b)=(c)	Estimated PM Peak Hour ^{5/} Ridership (d)	Volume/Capacity Ratio (d)/(c)
<u>Ferry/Market St.</u>						
5	TC	75	17.1	1282	1003	.78
6	TC	75	13.3	998	786	.77
7	TC	75	13.3	998	472	.47
8	TC	75	17.1	1283	1101	.86
21	TC	75	10.9	817	562	.69
31	MC	69.7	15	1056	723	.68
61	CC	76	10.9	828	668	.81
71	MC	69.7	6.7	467	251	.54
72	MC	69.7	6.7	467	356	.76
Subtotal				8196	5904	.72
<u>Other</u>						
15/42 (South)	MC	69.7	20	1394	1116	.80
15/42 (North)	MC	69.7	20	1394	552	.40
41 (South)	MC	69.7	6	418	170	.41
41 (North)	TC	75	17.1	1282	1035	.81
80	MC	69.7	6.7	467	425	.91
Subtotal				4955	3298	.67
TOTAL				26,004	19,337	.74

1/ TC = Trolley Coach, MC = Motor Coach, SC = Street Car, CC = Cable Car.

2/ San Francisco Municipal Railway, Five-Year Plan, 1979-1984 (Draft), P. 20.

3/ Ibid., p. 29-34, indicates August 1978 Route Data

4/ Based on average vehicle mix of 1979/1980 motorcoaches.

5/ The highest hour between 4 and 6 p.m., generally 4:30 to 5:30 p.m.

3. CALCULATION OF FUTURE P.M. PEAK-HOUR MUNI CAPACITY AND LOAD

The San Francisco Municipal Railway 5-Year Plan 1979-1984 (Draft) outlines the service changes that are planned for the next 5 years. Table 31 shows the calculations of the 1984 p.m. peak-hour MUNI capacities provided to the project site. The 1984 projected capacity to the study area is about 39% higher than the 1979 peak-hour capacity. The 5-Year Plan changes will be implemented in phases, with much of it dependent on MUNI Metro and electrification of some of the lines.^{1/} If a straight-line capacity increase is assumed between 1979 and 1984, the capacity increase available in 1982 (when the proposed project would be completed) would be 24% or a total of about 32,200 maximum passenger load.

The comparison for 11 MUNI lines serving the project site between 1976 and 1979, indicated that on the average ridership increased by about 1.6% during the afternoon peak period. If this trend would continue until 1982, total p.m. peak-hour ridership on the routes serving the project site would be 19,646 ($1.016 \times 19,337$ from Table 30). This does not include potential ridership increases due to the proposed project or to other major projects occurring in the study area and addressed in the cumulative impact analysis.

The overall volume/capacity ratio on all MUNI lines serving the proposed project would thus be 0.61 ($19,646/32,200$) in 1982 if none of the major projects in the area were developed.

To assess the cumulative impacts on MUNI of all major office developments under consideration in the San Francisco Downtown Office Zoning District, all MUNI lines serving the downtown area have to be taken into consideration in terms of their expected riderships and capacities. These lines are located beyond 1500 feet from the 315 Howard site, but are still within 1500 feet from the other proposed office developments. The

^{1/} Memo to Georges Jacquemart, Alan Voorhees & Associates from Barbara Brown, MUNI Planning Division, April 16, 1979.

TABLE 31

1984 P.M. PEAK HOUR CAPACITIES FOR MUNI LINES SERVING PROJECT SITE^{1/}

Line #	Vehicle Type ^{2/}	Recommended ^{3/} Maximum Passenger Load (a)	Avg. No. of Vehicles During PM Peak Hour (b)	Line Capacity (a)x(b)=(c)
<u>Mission Street</u>				
14	TC	75	30	2250
26	MC	68	12	816
Subtotal				<u>3066</u>
<u>Transbay Terminal</u>				
1X	MC	68	12	816
4	TC	75	10	750
5	TC	75	15.8	1185
6	TC	75	15	1125
31X	MC	68	7.5	510
38	MC	68	12	816
38L	MC	68	12	816
38AX	MC	68	6	408
38BX	MC	68	6	408
Subtotal				<u>6834</u>
<u>Ferry/Market St.</u>				
2	MC	68	10	680
3	TC	75	12	900
7	TC	75	8.6	645
8	TC	75	17.1	1282

^{1/} San Francisco Municipal Railway, Five-Year Plan 1979-1984 (Draft), and conversation with Barbara Brown, MUNI Planner, April 19, 1979; covers all routes within a 1500-foot radius from project site.

^{2/} TC = Trolley Coach, MC = Motor Coach, SC = Street Car, CC = Cable Car.

^{3/} San Francisco Municipal Railway, Op. cit., p. 20.

^{4/} San Francisco Municipal Railway, Op. cit., p. 265-266, Table IV-7: Tentative Recapitulation of Service and Vehicle Requirements.

TABLE 31

1984 P.M. PEAK HOUR CAPACITIES FOR MUNI LINES SERVING PROJECT SITE^{1/}

Line #	Vehicle ^{2/} Type	Recommended ^{3/} Maximum Passenger Load (a)	Avg. No. ^{4/} of Vehicles During PM Peak Hour (b)	Line Capacity (a)x(b)=(c)
<u>Ferry/Market (cont)</u>				
21	TC	75	12	900
25	MC	68	10	680
31	MC	68	7.5	510
61	CC	76	8	608
62	CC	76	7.1	540
71	MC	68	8.6	585
J	SC	138	15	2070
K	SC	138	15	2070
L	SC	138	24	3312
M	SC	138	15	2070
N	SC	138	30	4140
E	SC	138	8	1104
Subtotal				<u>22,096</u>
<u>Other</u>				
1	TC	75	15	1125
20	TC	75	20	1500
42	MC	68	12	816
45X	MC	68	12	816
Subtotal				<u>4257</u>
TOTAL				36,253

^{1/} San Francisco Municipal Railway, Five Year Plan 1979-1984 (Draft), and conversation with Barbara Brown, MUNI Planner, April 19, 1979; covers all routes within a 1500-foot radius from project site.

^{2/} TC = Trolley Coach, MC = Motor Coach, SC = Street Car, CC = Cable Car.

^{3/} San Francisco Municipal Railway, Op. cit., p. 20.

^{4/} San Francisco Municipal Railway, Op. cit., p. 265-266, Table IV-7: Tentative Recapitulation of Service and Vehicle Requirements.

following existing lines would have to be added: 1, 2, 2X, 3, 30, 30X, 38X, 45, 55, 80, and 85. And in the future with the 5-year service improvements under operation, lines 15, 30, 30X, 41, and 55 would have to be added. Basically MUNI riders entering or leaving the CBD and the total MUNI capacity provided into or out of the CBD have to be considered for the cumulative impact analysis.

Using the same methodology as for the ridership estimates for the MUNI service to the 315 Howard area, it is estimated that in 1982, afternoon peak-hour ridership leaving the San Francisco CBD would be about 33,000 passengers,^{1/} assuming that none of the projects under consideration would be implemented.

The MUNI 5-Year Plan 1979-1984 projects that the total outbound capacity out of the CBD, from 4:30 to 5:30 p.m. will be for 53,216 passengers,^{2/} an increase of 11,148 passengers over 1979 capacity. Assuming a straight-line capacity expansion between 1979 and 1984, the MUNI capacity supply in 1982 would be for 48,750 passengers. The 1982 volume/capacity ratio for all of downtown MUNI service would thus be $33,000/48,750 = 0.68$, in the afternoon peak hour, if none of the major office projects is implemented.

^{1/} From 1976 MUNI Passenger Report: 31,956 passengers (from 4:30 to 5:30 p.m.) x 1.016 x 1.016 (projected to 1982).

^{2/} San Francisco Municipal Railway, 5-Year Plan 1979-1984 (Draft), p. 155.

4. ESTIMATED TRAVEL GENERATION OF PROPOSED PROJECT AND EXPECTED TRAVEL MODES

The trip generation rate for the office space of the proposed project is the same as that used for the Proposed Pacific Gateway Office Project^{1/}, about half a block north:

- 17.5 daily person trips per 1000 square feet of leasable office area

It is not yet known which type of commercial uses would be located in the ground floor. Among the possible types of uses that have been mentioned by the project sponsor are public-oriented commercial facilities such as a cafeteria, a drugstore or a restaurant. Based on these possible uses and based on the Caltrans Trip Generation Reports^{2/}, it is determined that 100 daily person trips per 1000 square feet of leasable commercial area would be the highest generation rate for these uses. Assuming 200 square feet of leasable area per employee these rates would be the same as:

- 3.5 daily person trips per employee in office space
- 20 daily person trips per employee in commercial/retail space

Based on project data supplied by the project architect^{3/}, there would be 340,231 rentable square feet of office space (Plaza floor through the 22nd floor) and 5,000 rentable square feet of commercial area. Assuming that 25% of the commercial trips would remain internal within the building, the number of person trips generated by the proposed project would be 6204 on an average weekday.

1/ San Francisco Department of City Planning, Draft Environmental Impact Report, Proposed Pacific Gateway Office Building Project, San Francisco, California, EE 78.61, 1979.

2/ California Department of Transportation, Eleventh Progress Report on Trip End Generation Research Counts, 1976. Caltrans District IV.

3/ M. Arthur Gensler Jr. and Associates, 248 Battery Street, 078. 188. 000-5 January 30, 1979: Area Summary. The above area figure has been reduced since January 1979. The decrease is less than 10% and does not require a change in the calculation of impacts.

Assuming 200 square feet of leasable area per employee, and 2 home-to-work trips per employee, it can be determined that about 3,452 daily trips would be employee-generated commute trips. The remainder -- 2,752 daily person trips -- would be non-commute trips, e.g. shopping, banking, lunch, business visits, deliveries, etc.

To estimate the travel origins and travel modes of future project employees, the most recent available travel behavior surveys of downtown employees have been summarized and averages of seven survey results have been calculated. See Table 32. These averages are felt to be the most representative travel behavior data of the future employees of the proposed project. They indicate that about 43% of all project employees would travel by bus (about 26% by MUNI, 1% by SAMTRANS, 8% by AC Transit, 5% by Golden Gate buses and the remaining 3% by Greyhound, charters or jitneys), 17% would travel by BART, 2% by ferry, 4% by Southern Pacific commute trains and 3% would walk to work. The 43% proportion of bus travelers does not include those travelers transferring from other modes (BART, SP, ferries, Greyhound) onto MUNI buses to reach the project site. Table 33 shows the proportion of BART, SP, ferry and Greyhound riders that are assumed to transfer to MUNI buses to get to and from the proposed 315 Howard Building. Considering the 6% transfers onto MUNI buses, MUNI would carry a total share of 32% of the employees' commute trips. The estimated modal splits for commute travel would thus be the following:

car drivers	26%	
car passengers	5%	
MUNI	32%	
BART	17%	
AC Transit	8%	
Golden Gate Buses	5%	
Southern Pacific	4%	
Greyhound, charters, jitneys	3%	
walk	3%	
ferries	2%	
SAMTRANS	1%	
	<hr/>	
Total	106%	(adds to more than 100% because of transfers onto MUNI)

TABLE 32

TRIP DISTRIBUTION AND MODAL SPLIT OF DOWNTOWN EMPLOYEE WORK TRIPS
A SUMMARY OF PREVIOUS SURVEYS AND STUDIES

Residential Origin	Survey/Study	Percentages							
		Total	Auto Driver	Auto Passenger Carpool	Bus	BART	Ferry	SPRR	Walk
San Francisco	ITEL Survey ^{1/}	57-35	22-60	1-1	66-37	8-1	-	-	3-1
	1 Market Plaza ^{2/}	30	11	4	66	10	-	-	9
	Levi Strauss ^{3/}	43	15	5	61	10	-	-	0
	YBC EIR ^{4/}	62	(26)	(11)	(58)	(5)	-	-	N.A. ^{9/}
	Crocker Bank ^{5/}	41	14	3	67	7	-	-	9
	Federal Reserve ^{6/}	43	17	2	65	11	-	-	5
	S.F. Highrise St. ^{7/}	40	12	5	63	9	-	-	11
	Average	44	21	3	61	8			7
Peninsula	ITEL Survey	8-17	(56-94)	(N.A.) ^{8/}	(0-0)	(38-3)	-	(6-3)	-
	1 Market Plaza	17	28	11	11	16	-	34	-
	Levi Strauss	15	28	2	16	34	-	20	-
	YBC EIR	18	(54)	(21)	(16)	N.A.	-	(9)	-
	Crocker Bank	18	35	7	7	25	-	26	-
	Federal Reserve	21	26	3	10	42	-	19	-
	S. F. Highrise St.	14	27	10	13	30	-	20	-
	Average	16	29	7	11	29		24	

Note: The numbers in parentheses are not used in the calculation of averages because of incomplete modal split information.

TABLE 32

TRIP DISTRIBUTION AND MODAL SPLIT OF DOWNTOWN EMPLOYEE WORK TRIPS
A SUMMARY OF PREVIOUS SURVEYS AND STUDIES

Residential Origin	Survey/Study	Percentages							
		Total	Auto Driver	Auto Passenger Carpool	Bus	BART	Ferry	SPRR	Walk
East Bay	ITEL Survey	21-32	20-58	5-3	40-15	35-24	-	-	-
	1 Market Plaza	40	21	8	40	31	-	-	-
	Levi Strauss	26	10	3	39	48	-	-	-
	YBC EIR	14	31	13	30	26	-	-	-
	Crocker Bank	29	13	6	37	44	-	-	-
	Federal Reserve	25	14	3	40	43	-	-	-
	S.F. Highrise St.	30	38	15	23	23	-	-	-
	Average	27	26	7	33	34	-	-	-
North Bay	ITEL Survey	14-16	39-76	0-2	35-16	-	26-6	-	-
	1 Market Plaza	13	19	7	57	-	17	-	-
	Levi Strauss	16	20	6	43	-	31	-	-
	YBC EIR	6	46	19	30	-	5	-	-
	Crocker Bank	12	24	9	54	-	13	-	-
	Federal Reserve	11	24	3	55	-	18	-	-
	S.F. Highrise St.	16	(52)	(20)	(25)	-	N.A.	-	-
	Average	13	35	7	41	-	17	-	-
Total	All Downtown	100%	25%	5%	43%	17%	2%	4%	3%

Note: The numbers in parentheses are not used in the calculation of averages because of incomplete modal split information.

Table compiled by Alan M. Voorhees & Associates (4/27/79). Sources and footnotes are indicated on following page.

TABLE 32

Footnotes:

- 1/ San Francisco Department of City Planning, Draft Environmental Impact Report, Proposed 101 California Street Project, EE 78.27, 1979. Appendix P, Table P-1. Based on 480 survey questionnaires returned by ITEL employees. The first number represents the breakdown for clerical employees, the second number for executive employees. Auto passengers, other than "carpools" were included under "auto drivers".
- 2/ San Francisco Department of City Planning, Draft Environmental Impact Report, Proposed Pacific Gateway Office Building Project, San Francisco, California, EE 78.61, 1979. Table 5, P. 142. Based on survey conducted at One Market Plaza building. About 1040 surveys were returned from employees of Del Monte Corporation and a large law firm. No breakdown was given for auto passengers or carpools. A vehicle occupancy of 1.4 persons per car was assumed.
- 3/ San Francisco Department of City Planning, Final Environmental Impact Report, Levi's Plaza, EE 77.256, 14 December 1978, Appendix D-2, Table 21, P. 236. The results are based on the responses of 557 Levi Strauss employees, June 1977. Additional information has been provided by Levi Strauss Co.
- 4/ San Francisco Department of City Planning, Environmental Impact Report, Yerba Buena Center, Draft Appendices, EE 77.220, Appendix F, Tables F-14 and F-12, pages 84 and 86. Geographical distributions and modal splits shown in this table are the projections made in the YBC EIR for 1980 and are based on several planning studies. A vehicle-occupancy of 1.4 was assumed. No Peninsula trips were assigned to BART.
- 5/ San Francisco Department of City Planning, Draft Environmental Impact Report, Crocker National Bank, EE 78.298, 1979. Appendix, Tables A-5 and A-6, pages 188 and 189. Based on 1400 survey questionnaires distributed to Crocker employees.
- 6/ San Francisco Department of City Planning, Environmental Impact Report, Federal Reserve Bank of San Francisco, Draft EE 78.207, 1979, Tables 5 and 6 on pages 71 and 72. Based on 815 questionnaires.
- 7/ Based on "Study of Impact of Intensive High Rise Development in San Francisco," by Keyser, Marsten, Kaplan and McLaughlin and David Dornbusch. Client SPUR and HUD, March 1975. As reported in Final Environmental Impact Report, 595 Market Street, San Francisco Department of City Planning, EE 74.322. Appendix B, Chart B, page B3. A vehicle occupancy of 1.4 was assumed.
- 8/ Not Available. No carpools. Passengers included under auto driver.
- 9/ The walking mode was not included in the modal split analysis.

TABLE 33

ESTIMATED PROPORTION OF COMMUTE
TRIPS TRANSFERRING TO MUNI BUSES

Primary Mode of Transportation	Commute Modal Split	Distance to project (feet)	Proportion ^{1/} transfer to MUNI	Additional MUNI split
BART	17%	1400	4%	0.7%
Southern Pacific	4%	6700	73%	2.9%
Ferries	2%	2500	15%	0.3%
Greyhound	2%(est.)	7000	77%	<u>1.5%</u>
Total				5.4%
rounded-off upwards to represent a worst-case condition:				
				6%

^{1/} Source: Pedestrian Planning and Design, John J. Fruin, Ph.D., Metropolitan Association of Urban Designers and Environmental Planners, Inc. 1971. Figure 7.7 page 177.

Based on the peaking characteristics of office buildings,^{1/} afternoon peaking characteristics of MUNI ridership, and conversations with transportation staff from the San Francisco Department of City Planning,^{2/} it has been assumed that 30% of the daily transit travelers would travel during the morning and afternoon peak hour. This means that 60% of the employees traveling by transit arrive or leave during peak hours. For the auto and walking modes the peak-hour factor is assumed to be 25%.

Travel behavior would be different for the non-commute trips generated by the proposed project. These trips involve business trips, visitors, employees' lunch trips, errands, deliveries, etc. Generally these trips are more oriented towards San Francisco, and particularly downtown San Francisco, and they have higher proportions of trips by auto and walking. Table 34 shows the percentage geographical and modal distributions assumed for the non-commute trips. From the distributions in Table 34, and assuming the same proportions of transfers to MUNI buses from BART, SP, Ferries and Greyhound as indicated in Table 33, the following modal splits can be determined for non-commute travel:

car drivers	41%	
car passengers	4%	
MUNI	27%	
BART	5%	
AC Transit	0.4%	
Golden Gate Buses	0.4%	
Southern Pacific	0.5%	
Greyhound, charters, jitneys	1%	
walk	22%	
ferries	-	
SAMTRANS	0.2%	
Total	101.5%	(adds to more than 100% because of transfers to MUNI)

It is assumed that 10% of the non-commute trips generated by the proposed project would occur during the afternoon peak hour.

^{1/} California Department of Transportation, District 04, Tenth Progress Report on Trip Ends Generation Research Counts, 1975.

^{2/} Conversation with Ed Green, San Francisco Department of City Planning, April 25, 1979.

TABLE 34

TRIP DISTRIBUTION AND MODAL SPLIT OF NON-COMMUTE TRAVEL
GENERATED BY THE PROPOSED PROJECT

Geographical Origin/Destination	Percentages							
	Total non-commute trips	Auto driver	Auto passenger	Bus	BART	Ferry	SPRR	Walk
San Francisco CBD	44%	27%	3%	28% ^{1/}	2% ^{1/}	-	-	40%
San Francisco Remainder	40%	45%	5%	36%	4%	-	-	10%
Total San Francisco	84%	35%	4%	32%	3%			26%
Peninsula	7%	73%	7%	4%	9%	-	7%	-
East Bay	7%	77%	8%	7%	8%	-	-	-
North Bay	2%	68%	7%	24%	-	1%	-	-
Total	100%	41%	4%	27%	5%	-	0.5%	22%

Source: San Francisco Department of City Planning, Final Environmental Impact Report, 444 Market Street, San Francisco, California, EE 74.253, Table A-4, page A-17. The above source does not include any breakdowns for the different transit modes, such as the proportion of travellers from San Francisco using BART versus those using buses. The same breakdown between the transit modes has been used as for the commute trips (Table 32). A vehicle occupancy of 1.1 persons per car has been assumed.

^{1/} AMV estimates.

5. LEVEL OF SERVICE DESCRIPTIONS FOR WALKWAYS¹

<u>Level of Service A</u>	At walkway level-of-service A, sufficient area is provided for pedestrians to freely select their own walking speed, to bypass slower pedestrians, and to avoid crossing conflicts with others. (Average flow volume + 7 PFM ² of less).
<u>Level of Service B</u>	At walkway level-of-service B, sufficient space is available to select normal walking speed, and to bypass other pedestrians in primarily one-directional flows. Where reverse-direction or pedestrian crossing movements exist, minor conflicts will occur, slightly lowering mean pedestrian speeds and potential volumes. (Average flow volume = 7-10 PFM).
<u>Level of Service C</u>	At walkway level-of-service C, freedom to select individual walking speed and freely pass other pedestrians is restricted. Where pedestrian cross movements and reverse flows exist, there is a high probability of conflict requiring frequent adjustment of speed and direction to avoid contact. (Average flow volume = 10-15 PFM).
<u>Level of Service D</u>	At walkway level-of-service D, the majority of persons would have their normal walking speeds restricted and reduced, due to difficulties in bypassing slower-moving pedestrians and avoiding conflicts. Pedestrians involved in reverse-flow and crossing movements would be severely restricted, with the occurrence of multiple conflicts with others. (Average flow volume = 15-20 PFM) .
<u>Level of Service E</u>	At walkway level-of-service E, virtually all pedestrians would have their normal walking speeds restricted,

1 Source: Fruin, John J., Pedestrian Planning and Design, Metropolitan Association of Urban Designers and Environmental Planners, Inc. 1971.

2 PFM = Pedestrians per foot width of walkway, per minute.

and reduced, due to conflicts. Pedestrians involved in reverse-flow and crossing movements would be severely restricted, with the occurrence of multiple conflicts with others. (Average flow volume = 15 - 20PFM).

PEDESTRIAN LEVELS OF SERVICE

Level of Service	Walking Speed Choice	Conflicts	Average Flow Volumes (pedestrians/foot of sidewalk width/minute)
A	Free selection	None	7 or less
B	Some selection	Minor	7-10
C	Restricted	High probability	10-15
D	Majority restricted and reduced	Multiple	15-20
E	All restricted and reduced	Extreme	20-25
F	Extreme restriction shuffle only	Unfavorable Flow breakdown	variable up to 25

Source: Fruin, J. J., 1971, Pedestrian Planning and Design, Metropolitan Association of Urban Designers and Environmental Planners, New York, New York.

6. TRANSPORTATION TERMINOLOGY

ADT	(Average Daily Traffic) Total volume of traffic crossing a fixed point over a 24-hour period, averaged over a month, a year or several years.
Accessibility	The relative ease with which a location can be reached via various modes of transportation.
Arterial Road	A major roadway with partial control of access.
Capacity	Maximum number of vehicles, riders (transit) that can be carried during a determined period of time.
Collector Road	A roadway with uncontrolled access connecting arterials and freeways to local streets and private residences and businesses.
Directional Split	The difference in magnitude between volumes in one direction and volumes in the opposite direction on a road segment.
Freeway	High speed roadway with full control of access.
Full Control of Access	Preference is given to through traffic by providing access connections with selected public roads only and by prohibiting crossings at grade or direct private driveway connections.
HDV	Heavy Duty Vehicle. Any motor vehicle designated for transportation of property and rated at more than 6,000 lbs. from vehicle weight or designated primarily for transportation of persons and having a capacity of more than 12 persons.
Interchange	A system of interconnected roadways to provide interchange of traffic between two or more roadways, usually freeways.
Level of Service	Several methods can be used to describe the operating conditions on a given roadway when it is accommodating various traffic volumes. Level of service is a qualitative measure of the effects of traffic flow factors, such as speed and travel time, interruptions, freedom to maneuver, etc. Levels of service referred to in this report are: ¹

¹Definitions were derived from Highway Research Board, Highway Capacity Manual, Special Report No. 87, 1965. These are standard definitions used by the San Francisco Office of Environmental Review.

Level of service A describes a condition of free flow, with low volumes and high speeds. Traffic density is low, with speeds controlled by driver desires, speed limits, and physical roadway conditions. There is little or no restriction in maneuverability due to the presence of other vehicles, and drivers can maintain their desired speeds with little or no delay.

Level of service B is in the zone of stable flow, with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane of operation. Reductions in speed are not unreasonable, with a low probability of traffic flow being restricted. The lower limit (lowest speed, highest volume) of this level of service has been associated with service volumes used in the design of rural highways.

Level of service C is still in the zone of stable flow, but speeds and maneuverability are more closely controlled by the higher volumes. Most of the drivers are restricted in their freedom to select their own speed, change lanes, or pass. A relatively satisfactory operating speed is still obtained, with service volumes perhaps suitable for urban design practice.

Level of service D approaches unstable flow, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. Fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds. Drivers have little freedom to maneuver, and comfort and convenience are low, but conditions can be tolerated for short periods of time.

Level of service E cannot be described by speed alone, but represents operations at even lower operating speeds than in level D, with volumes at or near the capacity of the highway. Flow is unstable, and there may be stoppages of momentary duration.

Level of service F describes forced flow operations at low speeds, where volumes are below capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of the downstream congestion. In the extreme, both speed and volume can drop to zero.

Load Factor	Measure of degree of use of an intersection approach roadway during one hour of peak traffic flow.
Modal Split or Mode Split	The relative proportion of trips by each mode. For example, if 4 out of 100 trips from point A to point B were made by bus and 96 by auto, the bus and auto mode splits would be 4% and 96%, respectively.
Mode of Travel	Mode of travel is the means of transportation, whether by bus, car, subway, etc.
Partial Control	In addition to access to selected public roads, only limited access to private driveways and crossings at grade are also provided.
Peak Factor	Percent factor expressing peak-hour traffic as a proportion of ADT.
Peak Hour(s)	The 60 minute period(s) in which volume on traffic is highest for the day. The peak hours are typically around 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m.
Peak Hour/Peak Direction Factor	Percent factor expressing peak hour/peak direction traffic as proportion of ADT.
Peak Hour/Peak Direction Traf- fic	Highest peak hour traffic of both directions.
Uncontrolled Access	No limit to the number of accesses to the roadway is established.
Volume/Capacity Ratio, V/C Ratio	The ratio of volume of traffic to capacity for a road or road segment. The V/C ratios are useful to estimate levels of service and congestion.
Design Speed	The maximum safe speed that can be maintained over a specified section of highway when conditions are so favorable that the design features of the highway govern.

APPENDIX B
FUNDAMENTAL CONCEPTS OF
ENVIRONMENTAL NOISE

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April, 1979

Fundamental Concepts of Environmental Noise

This section provides background information to aid in understanding the technical aspects of this report.

Three dimensions of environmental noise are important in determining subjective response. These are:

- a. the intensity or level of the sound;
- b. the frequency spectrum of the sound;
- c. the time-varying character of the sound.

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB), with 0 dB corresponding roughly to the threshold of hearing.

The "frequency" of a sound refers to the number of complete pressure fluctuations per second in the sound. The unit of measurement is the cycle per second (cps) or Hertz (Hz). Most of the sounds which we hear in the environment do not consist of a single frequency, but of a broad band of frequencies, differing in level. The quantitative expression of the frequency and level content of a sound is its sound spectrum. A sound spectrum for engineering purposes is typically described in terms of octave bands which separate the audible frequency range (for human beings, from about 20 to 20,000 Hz) into ten segments.

Many rating methods have been devised to permit comparisons of sounds having quite different spectra. Fortunately, the simplest method correlates with human response practically as well as the more complex methods. This method consists of evaluating all of the frequencies of a sound in accordance with a weighting that progressively and severely deemphasizes the importance of frequency components below 1000 Hz, with mild deemphasis above 5000 Hz. This type of frequency weighting reflects the fact that human hearing is less sensitive at low frequencies and extreme high frequencies than in the frequency midrange.

The weighting curve described above is called "A" weighting, and the level so measured is called the "A-weighted sound level", or simply "A-level".

The A-level in decibels is expressed "dBA"; the appended letter "A" is a reminder of the particular kind of weighting used for the measurement. In practice, the A-level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. All U.S. and international standard sound level meters include such a filter. Typical A-levels measured in the environment and in industry are shown in Table 5, page 40.

Although the A-level may adequately describe environmental noise at any instant in time, the fact is that the community noise level varies continuously. Most environmental noise includes a conglomeration of distant noise sources which creates a relatively steady background noise in which no particular source is identifiable. These distant sources may include traffic, wind in trees, industrial activities, etc. These noise sources are relatively constant from moment to moment, but vary slowly from hour to hour as natural forces change or as human activity follows its daily cycle. Superimposed on this slowly varying background is a succession of identifiable noisy events of brief duration. These may include nearby activities or single vehicle passages, aircraft flyovers, etc., which cause the environmental noise level to vary from instant to instant.

To describe the time-varying character of environmental noise, the

statistical noise descriptors L10, L50, and L90 are commonly used. The L10 is the A-weighted sound level equaled or exceeded during 10 percent of a stated time period. The L10 is considered a good measure of the "average peak" noise. The L50 is the A-weighted sound level that is equaled or exceeded 50 percent of a stated time period. The L50 represents the median sound level. The L90 is the A-weighted sound level equaled or exceeded during 90 percent of a stated time period. The L90 is used to describe the background noise.

As it is often cumbersome to describe the noise environment with these statistical descriptors, a single number descriptor called the Leq is also widely used. The Leq is defined as the equivalent steady-state sound level which in a stated period of time would contain the same acoustic energy as the time-varying sound level during the same time period. The Leq is particularly useful in describing the subjective change in an environment where the source of noise remains the same but there is change in the level of activity. Widening roads and/or increasing traffic are examples of this kind of situation.

In determining the daily measure of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises.

During the nighttime, exterior background noises are generally lower than the daytime levels. However most household noise also decreases at night and exterior noises become very noticeable. Further most people are sleeping at night and are very sensitive to noise intrusion.

To account for human sensitivity to nighttime noise levels a descriptor, Ldn, (day-night equivalent sound level) was developed. The Ldn divides the 24-hour day into the daytime of 7 am to 10 pm and the nighttime of 10 pm to 7 am. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Ldn, then, is the A-weighted average sound level in decibels during a 24-hour period with 10 dBA added to the hourly Leqs during the nighttime. For highway noise environments the Leq during the peak traffic hour is approximately equal to the Ldn.

The effects of noise on people can be listed in three general categories:

- 1) subjective effects of annoyance, nuisance, dissatisfaction;
- 2) interference with activities such as speech, sleep, learning;
- 3) physiological effects such as startle, hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Unfortunately, there is as yet no completely satisfactory measure of the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance, and habituation to noise over differing individual past experiences with noise.

Thus, an important parameter in determining a person's subjective reaction to a new noise is the existing noise environment to which one has adapted: the so-called "ambient" noise. "Ambient" is defined as "the all-encompassing noise associated with a given environment, being a composite of sounds from many sources, near and far". In general, the more a new noise exceeds the previously existing ambient, the less acceptable the new noise will be judged by the hearers.

With regard to increases in noise level, knowledge of the following relationships will be helpful in understanding the quantitative sections of this report:

- a) Except in carefully controlled laboratory experiments, a

- change of only 1 dBA cannot be perceived.
- b) Outside of the laboratory, a 3-dBA change is considered a just-noticeable difference.
 - c) A change in level of at least 5 dBA is required before any noticeable change in community response would be expected.
 - d) A 10-dBA change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

APPENDIX C

MICROCLIMATE IMPACT STUDY ON THE
PROPOSED 315 HOWARD STREET OFFICE BUILDING

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I. INTRODUCTION

Architects, engineers, and city planners designing urban structures are limited by the lack of information on wind effects brought on by the presence of these structures, such as discomfort for pedestrians and wind-caused mechanical problems with doors, windows, and ventilating systems. Once a structure is built, remedial measures (if they exist at all) are usually very expensive.

It is virtually impossible to anticipate, by intuition, the winds that will be caused by a structure since they are determined by very complex interactions of forces. Fortunately, it is possible to predict the wind patterns and pressures around structures by testing scale models in a wind tunnel that can simulate natural winds near the ground. This allows the designer to foresee possible environmental and mechanical problems, and alleviate them before the building is erected.

Data from wind tunnel tests can be combined with climatological data to analyze the effect of a proposed structure on pedestrians in terms of human comfort. The frequency distribution of wind strengths at pedestrian level, combined with temperature data and shadow patterns of the proposed structure and its surroundings, can be used to forecast comfort at pedestrian levels.

II. SUMMARY

Existing winds on the site are low for the northwesterly wind direction because of the sheltering effect of upwind highrises and the East Bay Terminal. Wind conditions with the project would remain unchanged for this wind direction.

Existing winds are low to moderate under westerly conditions. The project would increase winds on the south side of Howard Street and at the Howard/Beale intersection, with existing low to moderately low winds increasing to moderately low to moderately high winds.

The project's shadows would affect the Beale Street/Howard Street intersection during spring, summer, and fall. The frequency of discomfort at the Howard/Beale intersection would be increased by higher winds and more frequent shade caused by the proposed building.

III. BUILDING AND SITE DESCRIPTION

The project site would be the northern corner of the block bounded by Howard, Beale, Fremont and Folsom Streets. The project site is on the southern fringe of the highrise area of downtown San Francisco. The area surrounding the site is a mixture of older lowrise and newer highrise structures. Freeway ramps pass to the north and east of the site. The East Bay Terminal is located one block west of the site.

The proposed building would be adjacent to the existing 215 Fremont Building, a nine-story office building. The southern half of the block is a parking lot; as are the blocks east of Beale Street.

The project would be a 24-story office structure which would be roughly square in plan view. Floors 20 through 24 would be sequentially set back from the Howard and Beale Street intersection and the north and south corners of the building would be splayed.

IV. MODEL AND WIND TUNNEL FACILITIES

Model

A scale model of the proposed building and nearby structures was constructed of polystyrene and urethane foams. A model of the structures surrounding the area for a distance of several blocks was constructed of polystyrene and urethane foam.

The scale used was 1 inch equals 30 feet. The model of the surrounding city area was built to this scale with building configurations and heights obtained from the Sanborn maps at the San Francisco Department of City Planning.

Wind Tunnel Facilities

The Environmental Impact Planning Corporation boundary layer wind tunnel was designed specifically for testing architectural models. The working section is 7 feet wide, 43 feet long, and

5 feet high. Wind velocities in the tunnel can be varied from 3.5 mph to 13 mph. The flow characteristics around sharp-edged objects such as architectural models are constant over the entire speed range. Low speeds are used for photographing tracer smoke, high speeds for windspeed measurements.

Simulation of the characteristics of the natural wind is facilitated by an arrangement of turbulence generators and roughness upwind of the test section. These allow adjustments in wind characteristics to provide for different scale models and varying terrain upwind of the project site.

Measurements of windspeed around the model are made with a hot-wire anemometer, a device that relates the cooling effect of the wind on a heated wire to the actual windspeed. The flow above the city is measured by a Pitot tube connected to a micro-manometer. The Pitot tube and micromanometer measure directly the pressure difference between moving and still air. This pressure difference is then related to the actual windspeed. Flow visualization is achieved with the use of floodlit smoke in conjunction with a 35-mm. camera.

V. TESTING METHODOLOGY

Simulation of Flow

The most important factors in assuring similarity between flow around a model in a wind tunnel and flow around the actual building are the structure of the approach flow and the geometric similarity between the model and the prototype. A theoretical discussion of the exact criteria for similarity is not included in this paper, but may be found elsewhere (Cermak, 1966, or Cermak and Arya, 1970).

The variation of windspeed with height (wind profile) was adjusted for the scale of the model and the type of terrain upwind of the site. The profiles used were those generally accepted as adequately describing the flow over that type of terrain (Lloyd, 1967).

Testing Procedure

The windflow characteristics of the site in its present state were investigated to ascertain the present wind environment. Windspeeds and wind directions at specified points throughout the site were measured and recorded. Wind direction was measured by releasing smoke at each point and recording the direction in which the smoke traveled. Windspeed measurements were made at the same points, at a scale height of five feet

above the ground. A hotwire anemometer probe is required to make these measurements within a fraction of an inch of the model surfaces. The probe is repeatedly calibrated against the absolute reading of a Pitot tube and micromanometer. Velocity readings close to the model are generally accurate to within 10 percent of the true velocity.

Before and after the test runs, a calibration measurement was made above the model. The purpose of these measurements was to relate the wind tunnel measurements to actual wind records from U.S. Weather Service wind instrumentation located on the Federal Building at 50 Fulton Street.

VI. TEST RESULTS AND DISCUSSION

Tests of windspeed and wind direction were conducted for two wind directions.

Measured windspeeds are expressed as percentages of the calibration windspeed, which corresponds to the actual windspeed at the San Francisco Weather Station. Thus, a plotted value of 52 means that the measured windspeed is expected to be 52% of the windspeed recorded by the Weather Service when winds are from that particular direction.

The plotted values can be interpreted in terms of general "windiness," using the scale below. This scale is subjective and is based on information gathered from similar studies in San Francisco.

<u>Velocity</u>	<u>Percentage of calibration windspeed</u>
Low	0- .19
Moderately low	.20- .29
Moderate	.30- .49
Moderately high	.50- .69
High	.70-1.00
Very high	> 1.00

It should be noted that the plotted values are not actual windspeeds, but ratios. Thus, a point having a "very high" windspeed would still experience light winds on a near-calm day. Likewise, a point found to have "low" winds could experience significant winds on an extremely windy day.

Wind direction is indicated by an arrow pointing in the direction of flow. Where wind direction fluctuated, two arrows representing the principal flow directions were plotted. Areas of fluctuating winds are normally turbulent as are areas of spiraling motion; the latter are denoted by curved arrows.

Northwest Wind

Northwest winds occur 12 to 39% of the time in San Francisco, depending on the season. (In meteorology, a northwest wind blows from the northwest.) Northwesterly and westerly winds are the most frequent and the strongest winds at all seasons in San Francisco. Northwest winds exceed 13 miles per hour 35% of the time and 25 miles per hour 3% of the time in summer. Wind frequencies and speeds are lower in spring, fall, and winter.

Existing conditions for northwest wind at the site are shown in Figure 1. Winds near the site are low due to the sheltering effect of upwind buildings and the East Bay Terminal building.

Site conditions for the proposed project (Figure 2) show that wind patterns and strength would be essentially unchanged from existing conditions.

However, open areas of the ground floor may cause pedestrians to experience uncomfortable turbulent winds combined with dust and litter.

West Wind

West winds occur between 15 and 40% of the time, depending on the season. They exceed 13 miles per hour 29% of the time and 25 miles per hour 7% of the time in summer. Wind strengths and frequencies are somewhat lower in spring, fall, and winter.

Existing conditions for westerly winds are shown in Figure 3. Upwind buildings have less of a sheltering effect for this direction as can be seen along Howard and Beale Streets where winds range from low to moderate. The four corners of the Howard/Beale intersection would experience wind increases with the existing low to moderately low winds increasing to moderately low to moderate values. Winds along Beale Street would generally decrease, but become more eddy-like in nature with frequent direction reversals.

Open areas of the ground floor would experience uncomfortably moderate winds with periods of turbulent wind carrying dust and litter. Most of this eddying would occur near the center of the open area where winds from perpendicular directions converge.

VII. SHADOW-PATTERN ANALYSIS

Elements of Comfort in San Francisco

Elements that influence comfort are temperature/humidity, sunshine, precipitation, and wind. Their relative importance varies with geographic location and the characteristics of the local climate. For the San Francisco region, the most important factors are temperature, solar radiation, and wind.

Temperatures in San Francisco are moderate due to the influence of marine air. Temperatures are highest in fall and lowest in winter; both spring and summer are normally cool, with a high frequency of low clouds and fog.

The intensity and frequency of sunshine are normally integrated into a single figure and expressed as "percentage of possible sunshine." San Francisco has two peak periods of sunshine, in April and in September. These months normally correspond to the transition periods between the strong marine airflow of summer and the transient storms of winter.

Wind in San Francisco is strongest in late spring and throughout the summer months, and lightest in winter. Summer winds have a large daily variation, with light winds during night and morning hours and peak winds during afternoon hours. Westerly winds are dominant in all months with the exception of December and January.

Sun-Shade Patterns

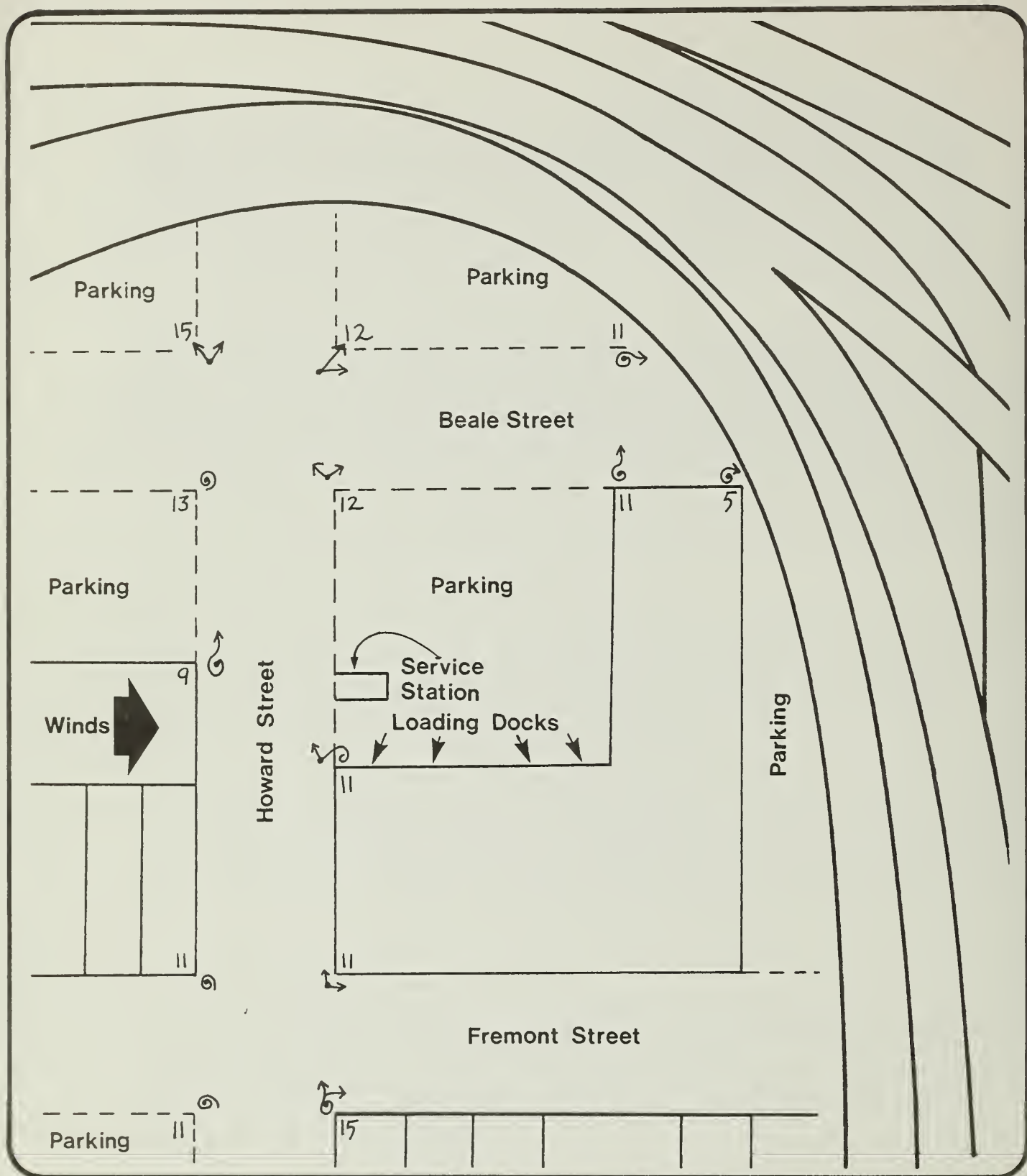
Sun-shade patterns for the first day of each season at 1 p.m. are shown in Figures 5 to 7. The project would shadow portions of the Howard/Beale intersection adjacent to the site during spring, summer, and fall. The corner across Beale Street, from the project toward the northeast, would receive shadowing during the afternoon hours of summer.

During the winters a portion of the Howard/Beale intersection is already shadowed by the 215 Fremont building. Construction of the proposed project would increase the shadow area. Project formed shadows would extend down Howard Street toward the elevated freeway.

VIII. MITIGATION MEASURES

There are 2 types of mitigating measures for wind. The first is to make major design changes to reduce winds near the project, such as different building orientations or changes in size or shape. Smaller, more slender buildings probably would have lesser wind impacts. Lowering the level of the building setbacks would also reduce increases near the Howard/Beale intersection.

The second type of mitigation measure involves additions to the project that would provide local shelter for pedestrians. Small structures such as kiosks for newspaper or flower vendors, telephone booths, and shelters at bus stops can serve in this way. Similarly, street trees and other vegetation can function as windbreaks. This type of measure would be appropriate at the Howard/Beale intersection and within the open area on the ground floor.



**Existing Site
Northwest Winds**

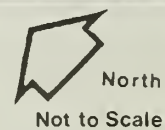
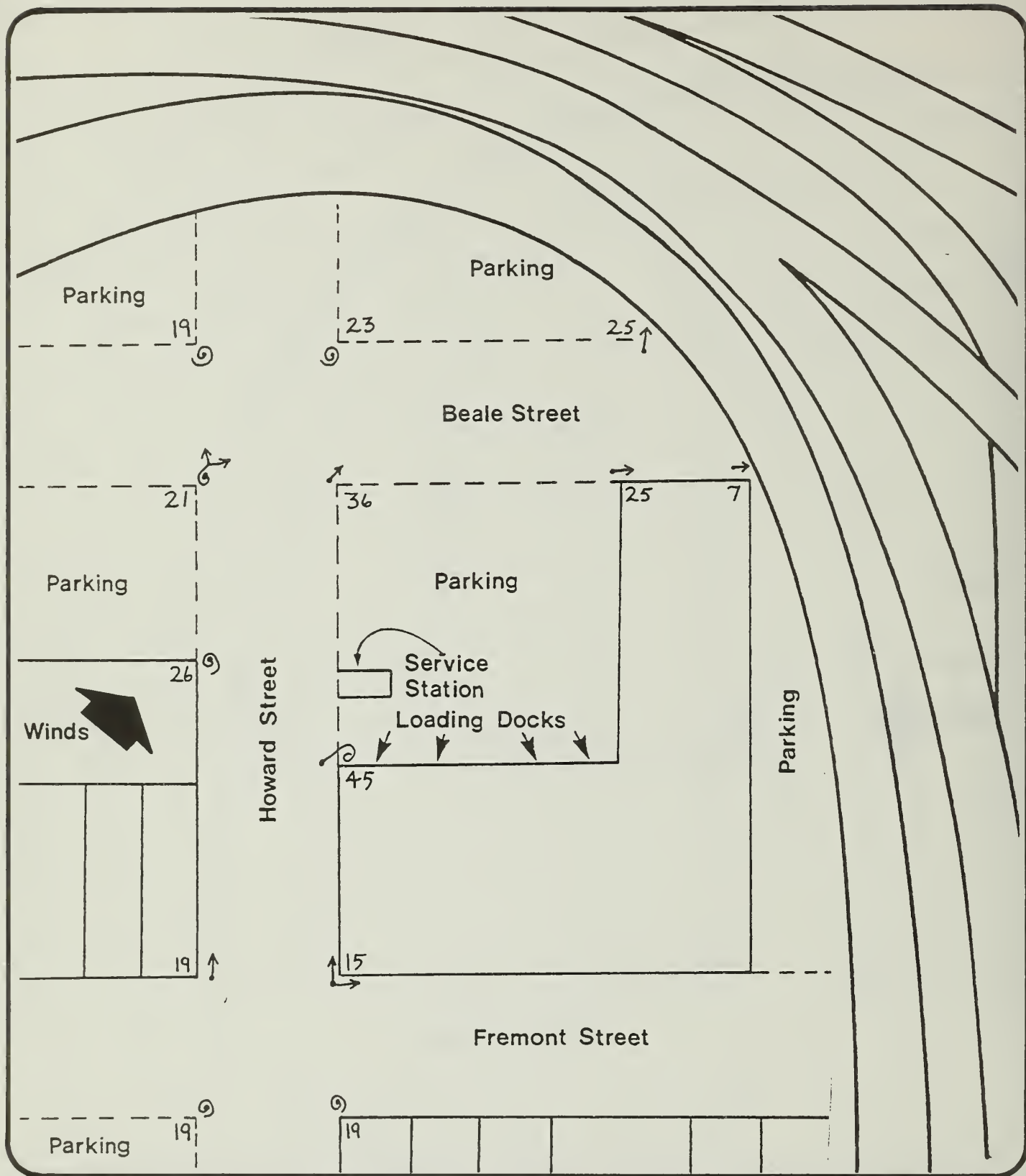


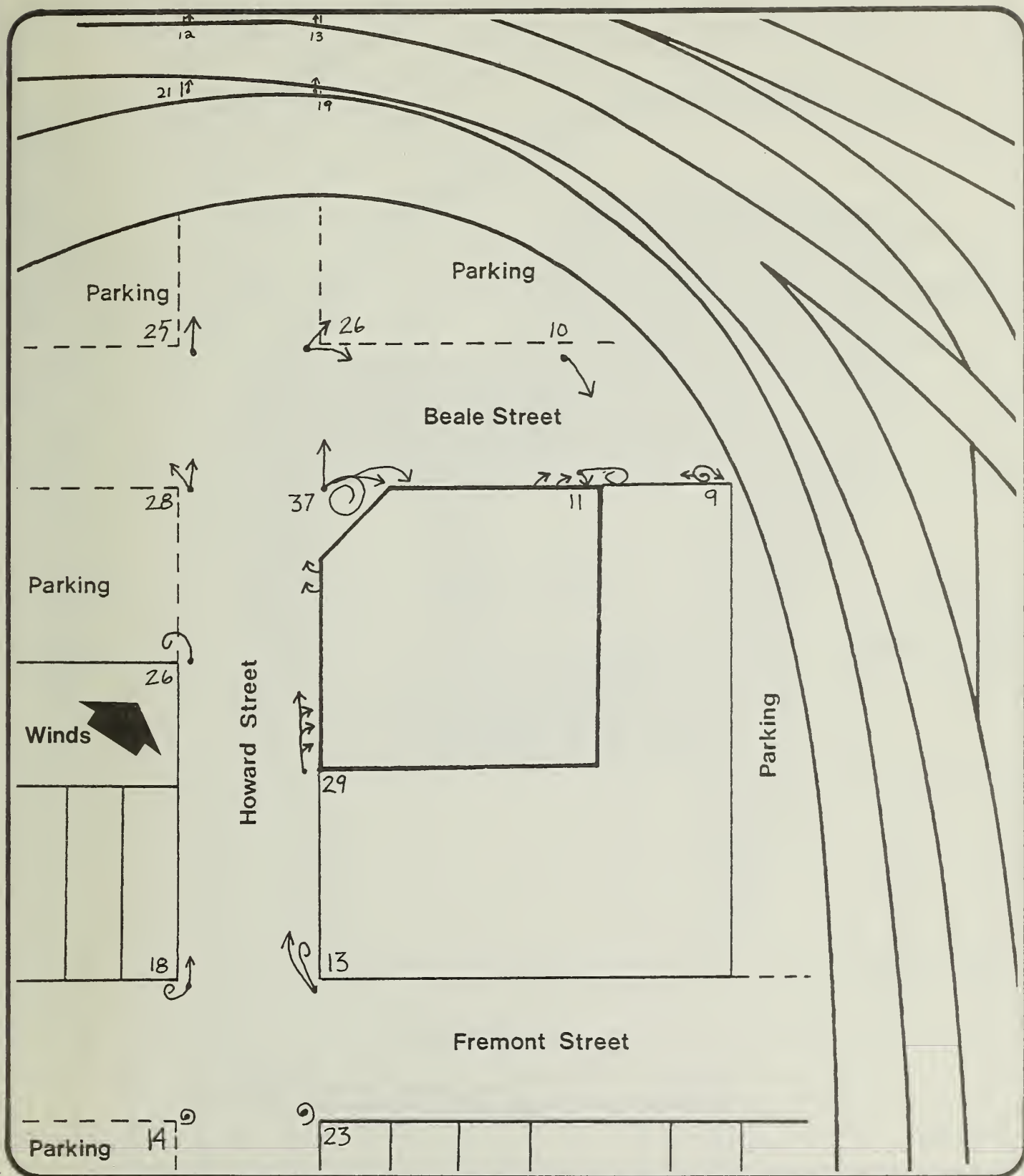
Figure No.1



**Existing Site
West Winds**



Figure No.3



Proposed Project West Winds

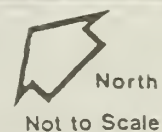
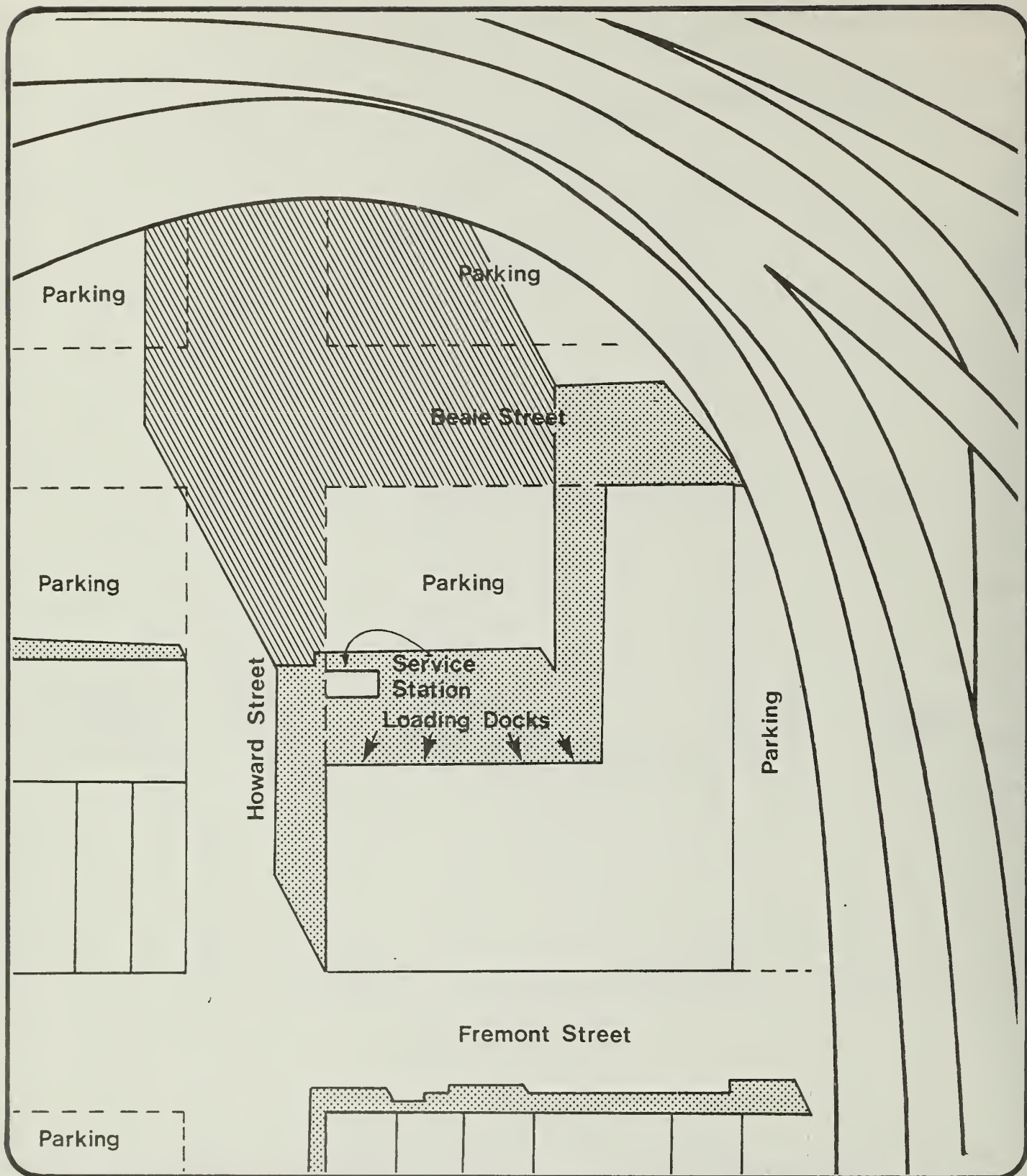


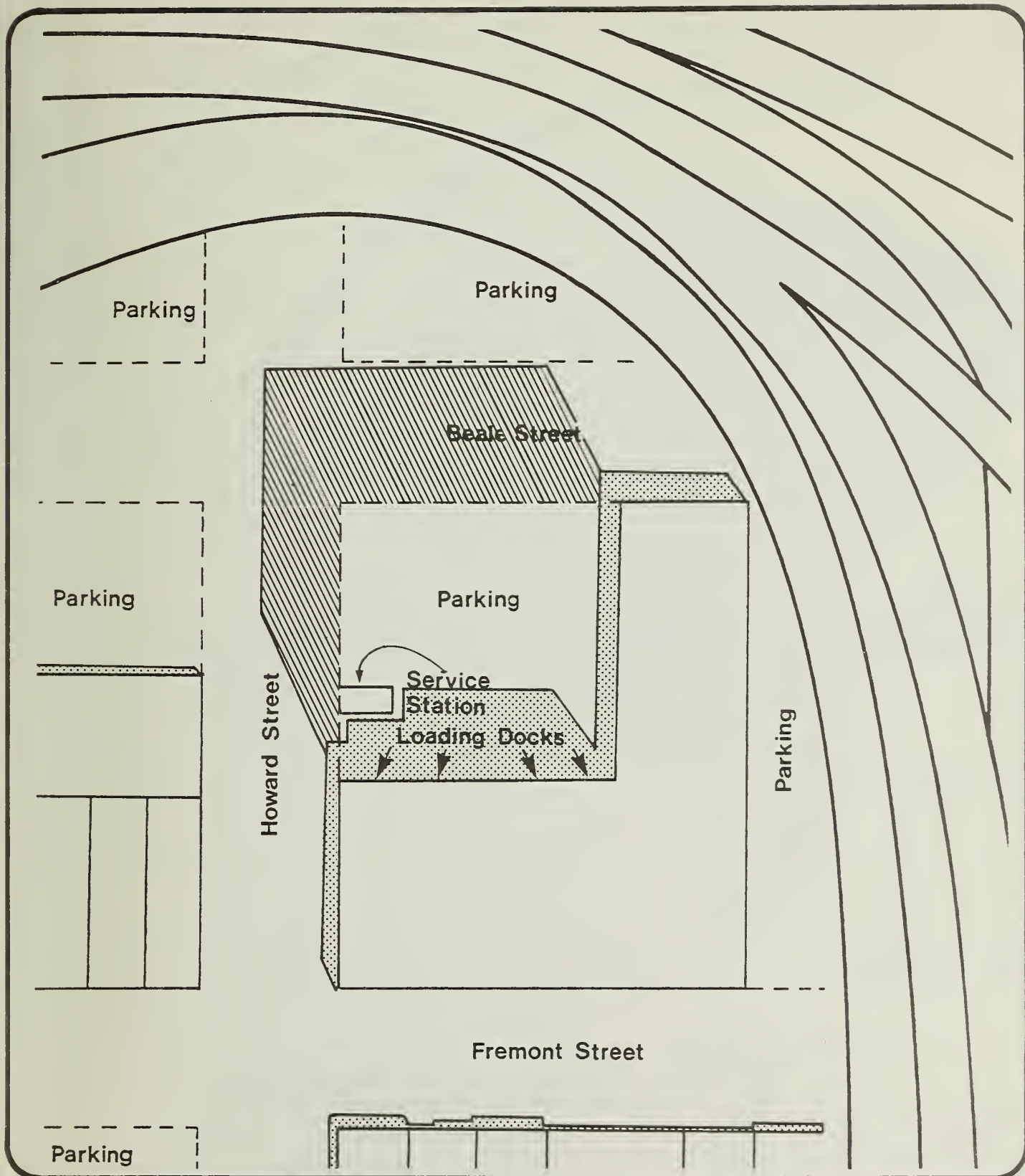
Figure No. 4



Sun-Shade Patterns
March 21 and September 21, 1:00 p.m.
 Existing  Proposed 



Figure No.5



Sun-Shade Patterns
June 21, 1:00 p.m.

Existing  Proposed 


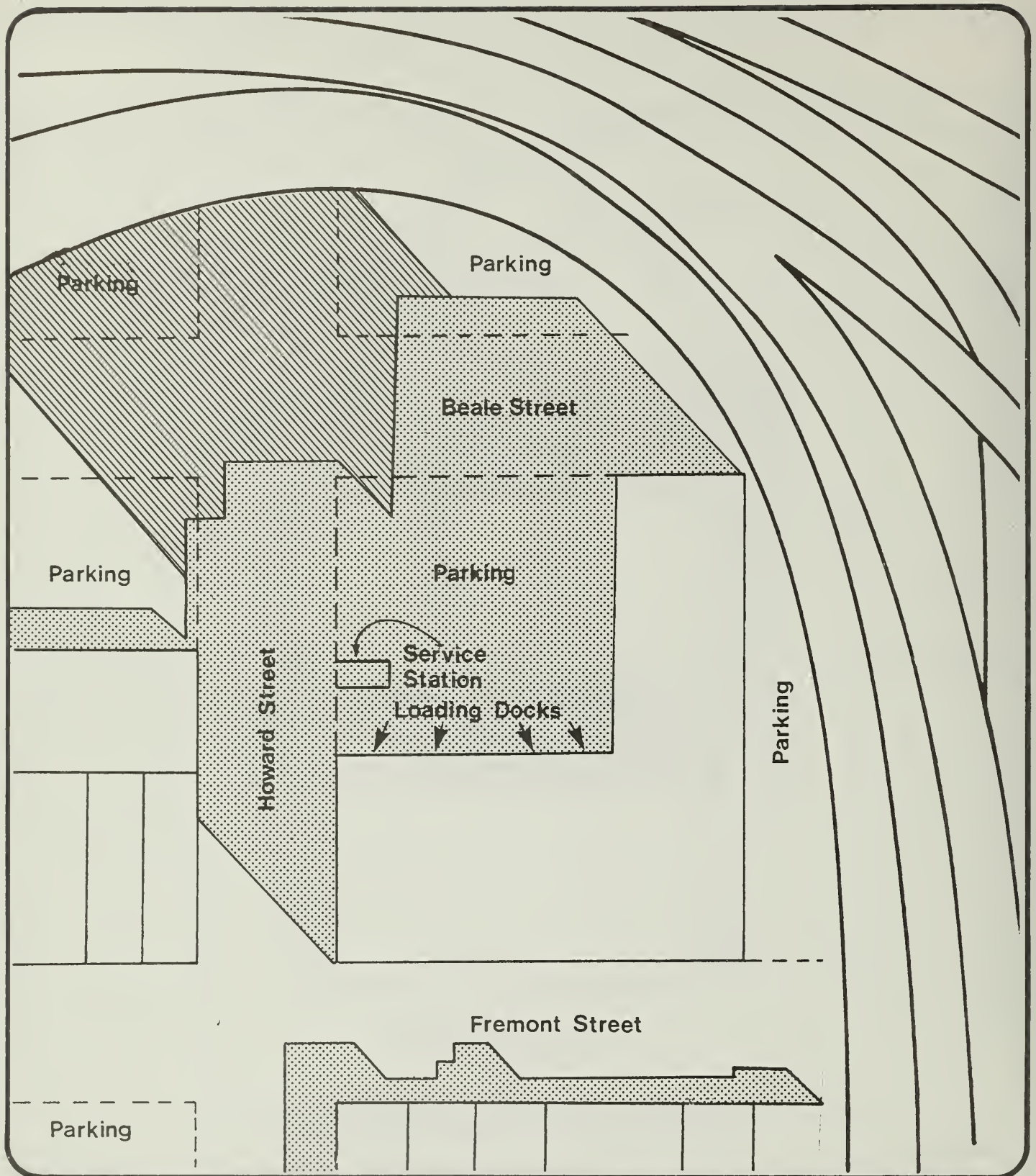
 North
 Not to Scale

Figure No.6



Sun-Shade Patterns December 21, 1:00 p.m.

Existing  Proposed 

Figure No.7

APPENDIX D

PROJECTED PROPERTY TAX REVENUES
TO THE CITY AND COUNTY OF SAN FRANCISCO
GENERATED BY THE PROPOSED 315 HOWARD STREET BUILDING

APPENDIX D

PROJECTED PROPERTY TAX REVENUES
TO THE CITY AND COUNTY OF SAN FRANCISCO
GENERATED BY THE PROPOSED 315 HOWARD STREET BUILDING

Total property tax revenues shown in Table 31 were based on replacement cost estimated as follows:

	<u>Millions of Dollars</u>
Land ²	2.0
Construction cost ²	
Shell	17.0
Interior finish ³	4.0
Interim financing @ 20%	4.6
Leasing costs @ 5%	<u>1.3</u>
TOTAL	28.9

¹Other than employees' payroll tax, for which assumptions were given in Table 13, Section III.I, page 114.

²Continental Development Corporation

³Does not include tenant improvements which would be taxed as personal property.

⁴The interim financing is included as it represents the total development cost on which the property tax is calculated.

Appendix E

An Investigation of Sun Reflection
Effects on Vehicle Drivers for the Proposed
315 Howard Street
Building

by
Steve Anderson
EIP Meteorologist

Introduction

The 315 Howard Office Building is proposed for a site in San Francisco where two sides of the building are near freeway ramps. Experience has shown that highrise office buildings which use reflective window glass, can present a hazard to drivers when they reflect sunlight. Window reflections could possibly temporarily blind drivers or distract them.

This analysis will assess the potential for this problem based on the geometry of the proposed building and the path of the sun in the sky at San Francisco's latitude.

Sun-Building Geometry

Sunlight reflections would appear to be a potential problem only at the off ramp to the southwest of the site. As reflections could only reach this off ramp from the southwest face of the proposed structure, only the southwest side of the building was considered.

The important factors determining the path of a reflection are the orientation of the building, the sun azimuth angle, and the sun elevation angle. The azimuth is the direction to the sun, measured in degrees. North is considered zero degrees, east is 90 degrees, south is 120 degrees, and west is 270 degrees.

Angles between the sun, observer and horizon are called sun elevation angles. The horizon is zero degrees and 90 degrees is directly up.

At any point along the freeway off ramp, reflection of sunlight can only occur for a discrete range of sun azimuth. The width of this range decreases as one moves farther from the structure. The range of azimuth angles that can potentially cause reflections has been calculated and is summarized below in Table I for different distances from the southwest wall.

Table I

<u>Distance from Southwest Wall</u>	<u>Range of azimuth that could cause a reflection</u>
250 feet	245-253
350 feet	243-250
450 feet	242-248

The other factor that will determine a reflection path is the elevation angle. The sun elevation angles vary with the time of day and the season. Sun elevations are lowest in winter and highest in summer.

Reflections can only reach a driver's eye if they have low elevation angles. This is because the roof of the automobile shades the drivers when the light source is above a critical angle. For this analysis an elevation angle of 30° was selected as a conservative value. Reflections are therefore not considered a problem unless they have an elevation angle of 30 degrees or less. The downward slope of the freeway ramp, which would tend to lower the elevation angle at which light affects a driver, was not considered.

A sun angle calculator was used to predict when the appropriate combinations of azimuth and elevation would occur at the three location previously mentioned. The results are shown below.

Table 2

<u>Distance from Southwest face</u>	<u>Dates</u>	
	<u>Fall-Winter</u>	<u>Winter-Spring</u>
250 feet	Sept. 6-Nov.16	Jan. 25-April 5
350 feet	Sept. 9-Nov. 21	Jan. 20-April 4
450 feet	Sept. 11-Dec. 1	Jan. 10-April 1

The dates in Table 2 represent the periods that a reflection could occur. The actual period of time when a reflection would occur would only be momentary at the first date (Fall-Winter sequence) and would increase to a maximum on the last date (the reverse would be true for the Winter-Spring sequence). Maximum total duration of reflection would occur at 450 feet from the building.

Reflection Severity

Strength of the reflection and the angle that it makes with the roadway are both functions of the hazard to drivers. The strength of the reflection is strongly dependent on the angle of incidence to the building face. When light strikes glass a portion of the energy is transmitted through the glass, a portion absorbed by the glass, and the remainder is reflected.

For the proposed building, the largest angle of incidence and weakest reflection, would occur when the sun has an azimuth of 225°(southwest). The angles of incidence during the time that reflections to the road are possible (Table I) range from 17 degrees.

to 40 degrees and are summarized below.

Table 3

<u>Distance from Southwest Face</u>	<u>Angle of Incidence</u>
250 feet	20° - 40°
350 feet	18° - 38°
450 feet	17° - 37°

The proportion of incident light reflected would not be significant for angles of incidence less than 45°, as most would be transmitted. The above table shows, therefore, that strong reflections from the proposed building would not occur along the freeway off-ramp.

Besides the strength of the reflection, the angle at which it approaches a driver is also important. Reflections that occur at small angles to the driver's line-of-sight would be most disturbing. For this building the strongest reflections would be coming towards the driver at an angle of approximately 35° from the left. They would not even temporarily blind a driver, but could be distracting.

Summary

The building and off-ramp geometry are such that reflections from the building to the ramp would only occur during the afternoon. The geometry also limits the strength of the reflections. Finally, during the late and early part of the year, San Francisco receives only about 65% of the available sunshine, so the percentage of possible time of reflections is further reduced.

Because of the above factors, it appears that reflections from the building would not be a hazard to drivers. For a short period of time on fall afternoons, drivers using the ramp would see reflections from the buildings, but their strength and angle would be such that it is unlikely to be a problem.

